A comprehensive examination of adolescent gambling

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Abstract

The purposes of this study were: a) to examine the prevalence and consequences associated with adolescent gambling, b) to examine the factors which influence adolescent gambling, c) to determine what factors discriminate among four groups of gamblers (no-risk/non-gamblers, low-risk gamblers, at-risk gamblers, and high-risk/problematic gamblers), and d) to examine the relation of gambling to nine other risk behaviours (i.e., alcohol use, smoking, marijuana use, hard drug use, sexual activity, minor delinquency, major delinquency, direct aggression, and indirect aggression). Adolescents (N = 3,767) from 25 secondary schools completed a two-hour survey that assessed involvement in risk behaviours as well as potential predictors from a wide range of contexts (school, neighbourhood, family, peer, and intrapersonal). The majority of adolescents reported gambling, although the frequency of gambling participation was low. The strongest predictors/discriminators of gambling involvement were gender, unstructured activities, structured activities, and risk attitudes/perceptions. In addition, the examination of the co-occurrence of gambling with other risk behaviours revealed that for high-risk/problem gamblers, the top three most frequent co-occurring high-risk behaviours were direct aggression, minor delinquency and alcohol. This study was the first to examine the continuum of gambling involvement (i.e., non-gambling to high risk/problematic gambling) using a comprehensive set of potential predictors with a large sample of secondary school students. The findings of this study support past research and theories (e.g., Theory of Triadic Influence) which suggest the importance of proximal variables in predicting risk behaviors. The next step, however, will be to examine the direct and indirect

effects of the ultimate (e.g., temperament), distal (e.g., parental relationship), and proximal variables (e.g., risk attitudes/perceptions) on gambling involvement in a longitudinal study.

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A comprehensive examination of adolescent gambling

Gambling is viewed by many people as a socially acceptable recreational activity (Abbott, 2001; Abbott & Cramer, 1993; Azmier, 2000). In fact, 72% of Canadian adults have reported gambling in the previous year (Azmier, 2000) and over 80% of American adults have reported gambling during their lifetime (National Research Council, 1999). Participation in gambling activities may be due, in part, to the availability of gambling opportunities. In Canada, there are reports of over 50 permanent casinos, 21,000 slot machines, 38,000 video lottery terminals, 20,000 annual bingo events, and 44 permanent horse race tracks (Azmier, 2000).

The use of gambling activities also is becoming common for charity and marketing purposes. Azmier (2000) stated that charitable gambling began in the early 1900s with raffles and bingo. Currently, million dollar lotteries are advertised in the media to support various charities. With respect to business, Schmidt (2000) stated that marketing companies increasingly are using promotional games where consumers have an opportunity to win a prize through luck or skill as an opportunity to build brand awareness, to influence customer behaviour, or to gain market share.

Along with the increase in availability of gambling has come a corresponding increase in attention to the impact of gambling on public health. For example, researchers have shown links between gambling and both increased rates of depression and lower self-esteem (Gupta & Derevensky, 1998a, 1998b). Much of the research to date, however, has been descriptive in nature and only recently have researchers begun to explore factors associated with gambling behaviour. Research on adolescent gambling is even more limited, although there is evidence to suggest

that problematic gambling might be even more prevalent with adolescents than with adults (Derevensky & Gupta, 2000b; Gupta & Derevensky, 1996; Jacobs, 2000; Lesieur et al., 1991; Wynne, Smith, & Jacobs, 1996). It is important, therefore, to examine gambling involvement with an adolescent sample. The purpose of this research was to examine gambling behaviour in an adolescent population and to gain insight into the factors which might be related to adolescent gambling across neighbourhood, school, family, peer, and intrapersonal domains.

What is Gambling?

In order to understand gambling behaviour, a common understanding of gambling must first be established. The National Research Council (NRC) (1999) defines gambling as the wagering of money on games of chance. The Oxford Dictionary offers a similar definition by defining gambling as "playing games of chance for money, taking a risky action in the hope of a desired result" (Pearson, 2001, p.582). While these definitions focus on common elements (wagering of money and the element of risk or chance), they do not consider the varying intents behind participation in some activities that are traditionally thought of as gambling. For example, should the purchase of a draw ticket for charity purposes be considered gambling? Is it gambling to participate in a fundraising bingo? In a recent study of Canadian gambling behaviours and attitudes, Azmier (2000) found that gambling was viewed as an acceptable activity as well as a personal right. In the same study, 61% of adults reported they did not consider gambling at charitable events really gambling, but rather as a donation to charity. Further, the perception of respondents was that gambling was not as serious a social problem as drug or alcohol addiction, smoking,

or reckless driving (Azmier, 2000). Abbott and Cramer (1993) found similar attitudes among American adult gamblers and non-gamblers where most viewed gambling as a harmless form of recreation.

Wildman (1997) suggested that any definition of gambling should address the fact that it is a "conscious, deliberate effort to stake valuables, usually but not always currency, on how some event happens to turn out" (p.1). Ferris (2001) suggested that a combination of excitement and level of involvement is perhaps the best way to determine what is or is not gambling. For example, if entering a draw for charity purposes is a rare occurrence and generates only a small amount of excitement, then perhaps this activity should not be considered gambling.

Further, it has been suggested that gambling involvement is best thought of on a continuum ranging from no gambling, to social or recreational gambling, to problematic gambling, to pathological gambling (Ferris & Wynne, 2001; NRC, 1999). The literature frequently uses problem gambling and pathological gambling interchangeably. Problematic gambling has been defined by Ferris and Wynne (2001) as "gambling behaviour that creates negative consequences for the gambler, for others in his or her social network, or for the community" (p.3). Pathological gambling was first included in the Diagnostic and Statistical Manual of Mental Disorders (DSM) in 1980 (NRC, 1999). It is described as "a continuous or periodic loss of control over gambling behaviours, a preoccupation with gambling and with obtaining money with which to gamble, irrational thinking, and a continuation of the behaviour despite adverse consequences" (NRC, 1999, p.2). On the other hand, social or recreational gambling can be thought of as participation in gambling activities without any

negative consequences. These variations in definitions of gambling and in criteria for a categorization of problem gambling may result in different interpretation of findings depending on what definition the researchers may use. In the development of the gambling questions for the present study, Wildman's definition that gambling refers to activities in which there is a "conscious, deliberate effort to stake valuables, usually but not always currency, on how some event happens to turn out" (1997, p.1), was used.

Reasons for Gambling

People choose to gamble for many reasons. Anderson and Brown (1984) found that reasons for gambling included enjoyment, to be sociable, to pass time, and to win money, while Dickerson et al. (1990) found that winning any amount of money, entertainment, and winning a large payout were the top three reasons for gambling. Azmier (2000) expanded this work and grouped adults' reasons for gambling into five categories: entertainment, thrill of winning, charity, social reasons, and other, but he did not define the categories. Overall, for all types of gambling, respondents indicated the strongest motivator to gamble was the thrill and reward of winning followed by a desire to donate to charities and entertainment.

Research exploring adolescents' reasons for gambling participation, however, is limited as researchers have offered pre-determined lists from which adolescents choose reasons for participation in gambling activities. Reasons that adolescents frequently choose for gambling are enjoyment, excitement, to make money, entertainment, something to do, and to forget troubles (Dickerson et al., 1990; Gupta & Derevensky, 1998a). An additional reason for adolescent gambling cited in studies

is the high level of social acceptance for gambling within Western society (Abbott, 2001; Azmier, 2000). Further, researchers have found that, for adolescents with serious gambling problems, gambling involvement may act as a coping mechanism for dealing with daily stresses and feelings of depression (Caffray & Schneider, 2000; Gupta & Derevensky, 1998a). While it appears that adolescents gamble for a number of reasons, it is not clear whether there would be additional or different reasons cited if adolescents were provided with an open-ended opportunity to discuss their attraction to participating in gambling activities.

Theories of Gambling Behaviour

Adolescent gambling appears to share some similarities with adolescent substance use. For example, similar to substance use, gambling behaviour often is classified into levels of engagement, such as low-risk, at-risk, and problematic (e.g., substance use: Smart, 1993, gambling: Ferris, Wynne, & Single, 1999). At the problematic level, both activities would meet the criteria for dependence or addiction as both are marked by a loss of control and the experience of negative consequences. In fact, problematic gambling problem behaviour currently is viewed as an addictive behaviour similar to substance abuse (Gupta & Derevensky, 1998a). Addiction is not consistently defined (Brands, Sproule, & Marshman, 1998), but generally refers to a dependent pattern of use and a loss of control related to the use of a substance or engagement in an activity such as gambling (Peele, 2001).

Winters and Anderson (2000) suggest that there may be multiple pathways to adolescent problem gambling and substance abuse behaviour. Multiple hypotheses for the acquisition, development and maintenance of gambling behaviour and substance

use including biological, psychological and social processes have been proposed (for gambling, see Sharpe, 2002; for substance use, see Petraitis, Flay, & Miller, 1995). Theories examining biological, environmental and psychological processes, specifically relating to gambling behaviour, are briefly examined below.

Biological Influences

Early speculations on the reasons for gambling include the consideration of a genetic component(s) which could explain problematic or pathological gambling (Blaszczynski, 2000; Blaszczynski & Nower, 2002; Eisen et al., 1997; Winters & Rich, 1998). To date, very few studies have examined this issue. One recent twin study examined male and female adult monozygotic and dizygotic twins for their association with "high action" versus "non-high-action" games (Winters & Rich, 1998). High action games were defined as games which potentially had high payoffs, such as lotteries or going to the casino. Non-high-action games were defined as games with lower payoffs and more informal involvement, such as social betting. While Winters and Rich (1998) did not find significant heritability estimates for overall gambling involvement, they did find genetic influences among male participants for high-action (large pay-out) gambling activities (lottery, scratch tabs, video lottery terminals, casino). A genetic influence was not found for women.

A second study examined the impact of inherited factors (primarily parental influences) and experience (events during childhood) on problem gambling in adult male monozygotic and dizygotic twins (Eisen et al., 1997). The researchers found that 62% of the variance in reported pathological gambling behaviour was accounted for by inherited and/or environmental experience shared by the siblings. Inherited factors

alone accounted for only 35% of the variance in gambling behaviour for individuals who reported not experiencing gambling consequences and explained 54% of the variance in gambling behaviour for participants who had experienced two or more symptoms of pathological gambling. These researchers concluded that familial influences explained a large proportion of adult problem gambling and suggested that, with increased availability of gambling, an increased prevalence of pathological gambling likely will result in individuals who are more vulnerable because of familial factors (Eisen et al., 1997).

In reviewing the biological correlates of gambling, Blaszczynski and Nower (2002) summarized past research indicating that there have been some links of mood regulators, such as linking serotonin, norepinephrine, and dopamine to impulsivity, mood disorders, and impaired control, and then linking impulsivity, mood disorders and impaired control to pathological gambling. Other speculations about biological influences include the functioning of the frontal lobe. In a recently published study, Bechara (2003) suggested that pathological gamblers may have abnormalities/delays in decision-making processes related to frontal lobe functioning as decision-making is guided by emotional signals. He found that for individuals with damage to the ventromedial sector of the prefrontal cortex, decision-making was impaired. When given a choice of actions, these individuals frequently would choose actions that brought immediate reward, regardless of the consequences. Further, Bechara (2003) suggested that prefrontal cortex dysfunction may be the primary mechanism for uncontrolled or impulsive behaviours such as pathological gambling.

Personality Theory

The basis of personality theory is that there are some underlying personality constructs which explain pathological gambling behaviour. Two aspects of personality frequently examined in relation to gambling behaviour are sensation seeking and risk-taking. Sensation seeking is defined as "the need for varied, novel and complex sensations and experiences, and the willingness to take physical and social risks for the sake of such experiences" (Zuckerman, 1979, p.10). Attention to sensation seeking is based in the belief that humans have optimum stimulation levels and that they seek ways to help maintain these levels of arousal (Steenkamp & Baumgartner, 1992). Zuckerman (1979) hypothesized that gamblers have higher than normal levels of sensation seeking. Support for this hypothesis has been mixed. While some studies have shown that participation in gambling has been significantly related to sensation seeking (Anderson & Brown, 1984; Dickerson, Walker, England & Hinchy, 1990; McDaniel, 2002), others have found lower than average levels of sensation seeking in pathological gamblers (Blaszczynski, Wilson, & McConaghy, 1986; Dickerson et al., 1990). The nature of the relation between gambling and sensation seeking is not clear.

The second personality aspect, risk-taking, is related to sensation seeking in that it has been linked to increased participation in risky sports (i.e., body contact) and gambling (Cross, Basten, Hendrick, Kristofic, & Schaffer, 1998; Zuckerman, 1979). Individuals may choose to engage in risky activities and continue to engage in these activities for a variety of reasons. Reasons for participation may include positive outcomes such as pleasure, peer acceptance and satisfaction of needs (Moore

& Gullone, 1996). Moore and Gullone (1996) found that it was these outcomes of risk-taking that supported further engagement in risk-taking behaviours. Specifically with respect to engagement in gambling, Ocean and Smith (1993) found the positive outcomes experienced by adults were similar to those of the adolescent sample (i.e., group affiliation, emotional support, and social status).

Social Learning Theory

According to social learning theorists, interpersonal or social influences are believed to be primary factors in shaping an individual's behaviour (Bandura, 1977, 1982). Individuals acquire attitudes and behaviours by observing and imitating role models who could be close friends or family (older siblings or parents). A recent study found that adolescents who have parents who gambled excessively were twice as likely to have a problem or to be at-risk for gambling problems as adolescents with parents who did not gamble excessively (Govoni, Rupcich, & Frisch, 1996).

In addition, Ladouceur, Jacques, Ferland ,and Giroux (1998) examined parents' attitudes toward adolescent gambling and found that 84% of parents indicated that they would buy lottery tickets for their child. Researchers have found that between 68% and 86% of adolescents reported gambling with their families and in many instances, reported that their parents purchased lottery tickets, pull tabs, or scratch tickets for them (Gupta & Derevensky, 1997; Moore & Ohtsuka, 1997; Winters, Stinchfield, & Kim, 1995). Gupta and Derevensky reported that 53% of children who had gambled within the last 12 months reported gambling with siblings, 40% gambled with parents, 46% gambled with other relatives, and 75% gambled in

their own homes. These findings suggest that gambling may be an aspect of family entertainment.

Peers also may play a role in supporting gambling behaviour through encouragement and social reinforcement (Hardoon & Derevensky, 2002). In a study of pre-school children, Kearney and Drabman (1992) found that children took more risks to obtain a large reward if they previously had been exposed to a peer who won a large high-risk game. In fact, 71.4% of the participants risked all their winnings for a 10% chance to win a large prize.

Cognitive-Affective Theories

Cognitive perspectives on gambling may assist with the understanding of an individual's persistence at participation in gambling activities despite the fact that often that individual does not win (Hardoon & Derevensky, 2002). Researchers have shown that most gamblers (83%) had experienced a big win at some time with about a quarter of the gamblers having experienced the win early in their gambling history (Dickerson et al., 1990). This early win may serve as an incentive for continued gambling regardless of the number of failures experienced, and may create a schema (i.e., knowledge that wins are possible when gambling) that reinforces continued gambling behaviour.

There also appears to be some cognitive distortion in the determination of what ticket has the best chance of winning in a lottery. Some gamblers appear to ignore the randomness inherent in many games and instead perceive that they have control over the outcome of a game depending on the strategy they use. Hardoon, Baboushkin, Derevensky, and Gupta (2001) noted that cognitive rationalizations for

selecting lottery tickets are irrational given that all tickets have an equal chance of winning. In their study of lottery ticket selection, undergraduate students were presented with several tickets categorized as a long sequence of numbers, numbers with a pseudo-psychological order, and numbers that appeared to be random. Participants were asked to rank the tickets in sequential order from the ticket most likely to win to the ticket least likely to win. Participants were given an opportunity to increase the chances of the "least winning" ticket to win. The majority of respondents changed the numbers to appear more random. Participants also were asked to indicate their rationale for the selection and any changes they made to tickets. The perceived randomness of the ticket was the most frequently cited reason for selection. The second most common reason was that the ticket held numbers that were significant to them. Hardoon et al. (2001) found that this distortion was more prevalent in regular gamblers and problem gamblers than non-gamblers. They also found that cognitive distortions were the greatest with the pathological gamblers. Hardoon et al. (2001) hypothesized that the more an individual gambles, and the more consequences that individual experiences associated with their gambling, the more distorted their beliefs become as a result of past experiences (see also Griffiths, 1990, 1995).

Problem Gambling Causal Pathway Model

Blaszczynski (2000; Blaszczynski & Nower, 2002) proposed a causal pathway model for problem gambling that includes ecological, psychological, and biological factors. This proposed model suggests that there may be three major causes of gambling resulting in three types of gamblers: the behaviourally conditioned problem gambler, the emotionally vulnerable problem gambler, and the biologically-based

impulsive problem gambler. The behaviourally conditioned problem gambler refers to individuals characterized by a fluctuation between regular and excessive gambling because of variable reinforcement through winning, distorted thinking around the probability of winning, and/or poor decision-making. These gamblers initiate gambling either through chance or through family and peer influences. With these gamblers, there often is an absence of any specific pre-morbid feature of psychopathology. Emotionally vulnerable gamblers are individuals who show evidence of affective disturbances such as depression or who may have experienced situational stress which precipitated increased gambling. Biologically-based gamblers are individuals who have traits such as impulsivity or high levels of psychopathology across a number of domains, such as severe disruptive behaviours in gambling and in general social functioning.

Blaszczynski (2000; Blaszczynski & Nower, 2002) suggests that there are three common elements found within each of the types of gamblers. The first element refers to the availability and access to gambling establishments. With increases in availability of gambling establishments comes an increase in gambling. The second element is an aspect of conditioning where wins are thought to create a state of excitement described as the equivalent to a "drug-induced high." A win is likely to be experienced at variable intervals leading the individual to continually seek the feeling of excitement and anticipation that may lead to the ultimate high, the win. The third element, cognitive processes, refers to Blaszczynski's belief that early and repeated wins create schemas (i.e., knowledge that wins are possible when gambling) that reinforce continued gambling behaviour. These schemas may result in irrational

belief structures which promote gambling as an effective source of income generation. This causal pathway model has yet to be tested within the literature.

Theory of Triadic Influence

Petraitis, Flay and Miller (1995) reviewed 14 multivariate theories of adolescent experimentation with substance use (theory of planned behaviour: Ajzen, 1988; theory of reasoned action: Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975; social learning theory: Akers, 1977; Akers, Krohn, Lanza-Kaduce, & Radosevich, 1979; social cognitive/learning theory: Bandura, 1986; social control theory: Elliott, Huizinga, & Menard, 1989; social development model: Hawkins & Weis, 1985; social ecology model: Kumpfer & Turner, 1990-1991; self-derogation theory: Kaplan, Martin, & Robbins, 1982, 1984; multistage social learning model: Simons, Conger, & Whitbeck, 1988; family interaction theory: Brook, Brook, Gordon, Whiteman, & Cohen, 1990; problem-behaviour theory: Jessor & Jessor, 1977; peer cluster theory: Oetting & Beauvais, 1987; model of vulnerability: Sher, 1991; domain model: Huba & Bentler, 1982) and attempted to integrate these theories into three distinct types of influence (social, attitudinal, and intrapersonal) and three levels of influence (proximal, distal and ultimate) referred to as the Theory of Triadic Influence (TTI). While the TTI specifically addresses adolescent experimentation with substances, the theory also has implications for other health risk behaviours such as adolescent gambling behaviour.

The first type of influence, social factors, considers the characteristics and behaviours of the people who form an intimate support system for adolescents. Theories relating to the support system primarily focus on parents and peers and

include influences such as inadequate parental warmth, supervision, control, and reinforcement, negative evaluations from parents, home strain, parental divorce or separation, and friendship quality (Petraitis et al., 1995). It is speculated that these characteristics will relate to the attachment an adolescent will have to role models and in turn, relate to their desire to comply with the wishes of various role models regarding their substance use. In addition, social factors are thought to relate to the adolescent's beliefs about the normativeness of substance use and the substance-specific attitudes and behaviours of role models. For example, if a role model (e.g., parent, sibling, friend) uses alcohol excessively on a regular basis, an adolescent may perceive that excessive use is normal behaviour. These factors are thought to be related to adolescent experimentation with substances and stress the importance of the roles played by individuals within an adolescent's support system.

Central to the theories on the second type of influence, attitudinal factors, are the adolescents' orientations toward their own experimentation with substances. While attitudinal theories are less common than social influence theories, they suggest that personal values regarding the use of substances play a critical role in attitudes toward experimentation with substances. After reviewing the theories, Petraitis et al. (1995) suggest that adolescents may be more likely to experiment with substances if they are not committed to conventional society, religion, school, or people who hold negative views of experimentation. Further, the authors indicate that when taken together, these theories suggest that experimentation may be a symbolic rejection of conventional standards. In addition, individuals are thought to be more likely to experiment with substances if they are oriented toward short-term goals;

have little interest in success or achievement; desire independence from parents; or hold tolerant or positive attitudes toward other deviant behaviours

The third type of influence proposed by Petraitis et al. (1995), intrapersonal influences, focuses on personality traits, dispositions and affective states, general behavioural skills, and adolescents' beliefs about their behavioural skills relating to substance use. In the review of the theories Petraitis et al. (1995) cited an extensive list of intrapersonal influences such as impaired cognitive functions, pharmacological sensitivity to substance use, impulsiveness, aggressiveness, emotional distress, extraversion, and sociability, tendencies toward risk-taking and thrill-seeking, external locus of control, low self-esteem, poor coping skills, deficient social interaction skills, poor academic skills, and poor substance-specific self-efficacy. Social, attitudinal, and intrapersonal factors may each contribute to whether an adolescent will choose to experiment with substances.

Petraitis et al. (1995) also examined three levels of influence on adolescent experimentation of substance use: ultimate, distal and proximal. The first level, ultimate influences, refers to the broad, exogenous factors that are beyond an individual's control but place the individual at-risk for experimentation with substances (Petraitis et al., 1995). These factors may include: academic and occupational opportunities; school quality; neighbourhood crime rates; parental divorce; opportunities for reinforcement by parents and schools; parenting style; personality traits such as impulse control, aggressiveness, temperament, neuroticism and sociability; availability of substances; media influences; and community-wide sanctions.

The second level, distal influences, refers to factors over which the adolescent may have some control, such as attachment to peers and parents, as well as intrapersonal factors such as affective states (e.g., depression, self-esteem). Overall, therefore, distal factors that are suggested by multiple theories include strong peer attachment, poor family attachment, poor commitment to social convention, and substance use modeling by family or peers.

The third level, proximal influences, generally are highly predictive of a given behaviour but focus primarily on the precursors to that behaviour such as intentions, decisions, experimentation, normative perceptions, attitudes, and self-efficacy relating to a specific behaviour. These influences are closest to the individual's actions and therefore are most likely to predict substance use (Petraitis et al., 1995). While these variables can account for much of the variance in substance use, they do not explain the origins of the behaviour (Petraitis et al., 1995). Overall, Petraitis et al.'s integration of the many theories examining substance use suggests that the origins of adolescent experimentation in substance use are complex and multifaceted, including intrapersonal, family, peer, community, and school factors.

Each of the above theories provides some insight into adolescent gambling. The TTI, however, offers the most comprehensive approach to the examination of potential factors which may be associated with gambling behaviour. Some of the factors cited in Petraitis et al. (1995) have been examined specifically in relation to gambling behaviour. Researchers have found that a history of parental gambling, heavy parental gambling, regular drug use (tobacco, alcohol, marijuana or amphetamines), truancy, poor school performance, low self-esteem, depressive mood,

victim of physical or sexual abuse, history of delinquency (related to personality trait of disinhibition or poor impulse control), being male, early onset of gambling, and community and family norms that promote accessibility to gambling opportunities were significantly related to gambling problems (Barnes, Welte, Hoffman, & Dintcheff, 1999; Kaminer, Burleson, & Jadamec, 2002; Stinchfield & Winters, 1998; Winters, Stinchfield, & Fulkerson, 1993b). Intrapersonally, an early "big win" also has been reported to be a factor underlying problem gambling behaviour (Griffiths, 1995). With respect to peers, Griffiths (1990) reported that 44% of adolescents initiated gambling behaviour because their friends were engaging in similar practices.

Unfortunately, gambling research has examined only a few factors concurrently. A comprehensive examination of the factors identified by Petraitis et al. (1995), particularly across community, family, peer, school, and intrapersonal contexts, has yet to be undertaken with respect to gambling behaviour. The present study examines a comprehensive set of 56 predictors drawn largely from Petraitis et al.'s (1995) Theory of Triadic Influence which include predictors identified by the major theories outlined earlier (e.g., temperament, perceptions of risk, parental and peer attitudes). This study is the first to include a diverse set of potential predictors of involvement in gambling activities.

Risk and Protective Factors Related to Gambling Involvement

To date, gambling researchers have focused primarily on examining only a few potential risk and protective factors in their studies of adolescent gambling behaviour, rather than including a comprehensive set of predictors in one study as suggested by the theories outlined earlier. A risk factor is described by Clayton

(1992) as an individual characteristic, situation, or environmental context that increases the likelihood of participation in a particular behaviour (e.g., availability of substances or gambling in a school environment). In the presence of risk, a protective factor decreases the likelihood of onset or severity of participation in a particular behaviour (e.g., good relationship with parents) (Winters & Anderson, 2000). Although many researchers view a protective factor as the opposite of a risk factor for ease of conceptualization, this view is not always correct. The opposite, or absence of a risk factor, does not necessarily mean that it is protective in nature. For example, while a family history of substance abuse is a known risk factor for substance abuse, the absence of a family history does not necessarily protect an individual from developing problems with substance use.

To date, the identification of both risk and protective factors which contribute to gambling activities have been based on the substance abuse literature (Gupta & Derevensky, 1998a). Research specifically on risk factors for adolescent gambling behaviour has found that gambling is more prevalent among males than females (Govoni, Rupcich, & Frisch, 1996; Gupta & Derevensky, 1998b, 2001; Ladouceur, Dube & Bujold, 1994). When compared to non-problem gamblers, problem gamblers report gambling at an early age (Gupta & Derevensky, 1997, 1998a); they have higher rates of depression (Gupta & Derevensky, 1998a, 1998b); and they score higher on impulsivity (Vitaro, Ferland, Jacques, & Ladouceur, 1998). Pathological gamblers have been found to have lower self-esteem (Gupta & Derevensky, 1998b). In addition, both at-risk and probable pathological gamblers have been found to report higher numbers of major and minor life events than non-gamblers and social

gamblers (Gupta & Derevensky, 2001). Again, however, research on adolescent gambling behaviour has been limited in the number of potential risk and protective factors included in one study. This study includes a comprehensive set of variables in predicting gambling behaviour, including variables identified in the literature as potential risk and protective factors (gender, depression, self-esteem etc.).

Prevalence of Gambling

Gambling Activities

Winters et al. (1993b) surveyed adolescent gambling activities and found that only 14% of adolescents had no history of gambling and for those who did report gambling, the average age of first gambling experience was 11.5 years (Gupta & Derevensky, 1998b). To illustrate the scope of involvement in gambling activities, a study of primary school students aged 8 to 12 revealed that 86% reported betting with money at some point in their lifetime (Ladouceur, Dubé, & Bujold, 1994). In studies of adolescents, 90% reported gambling in their lifetime; 71 to 85% of the respondents reported gambling in the last year; 55 to 57% gambled less than once per week; and 15 to 35% gambled a minimum of once per week (Derevensky & Gupta, 2000a; Gupta & Derevensky, 1998a; Winters, Stinchfield, & Fulkerson, 1993b). Winters et al. (1993b) found that, of eleven common gambling activities (e.g., playing cards, betting on games of personal skill, betting on sports teams, playing scratch tabs, playing bingo pull tabs, playing coin flipping, playing dice games, playing the lottery, playing gambling machines, and betting on horse or dog races), playing cards for money had the highest lifetime prevalence rate (50.0%), followed by betting on games of personal skill (42.6%), betting on sports teams (38.8%), and playing scratch

tabs (36.8%). Males reported gambling more than females (Derevensky & Gupta, 2000b), and females also reported participating in fewer types of gambling activities than males (Hraba, & Lee, 1996). Males tend to prefer sports lottery tickets and sports pool betting, while females indicated preference for lottery tickets and bingo (Gupta & Derevensky, 1998b). Given these findings, an examination of gender differences also was included in the present study.

Gambling Problems

Adolescent problem gambling rates are reported to be more than double the adult rates (Derevensky & Gupta, 2000b; Gupta & Derevensky, 1996; Jacobs, 2000; Lesieur et al., 1991; Wynne, Smith, & Jacobs, 1996). Lifetime prevalence rates of adult pathological gamblers range from 0.1 to 3.1% (NRC, 1999). It has been estimated that between 3.4 and 8.7% of the adolescent population, however, are probable pathological gamblers (Derevensky & Gupta, 2000a; Gupta & Derevensky, 1998a; Winters, Stinchfield, & Fulkerson, 1993). Further, between 1.4 and 12.0% of adult gamblers are classified as problem gamblers (NRC, 1999) while 10-14% of adolescent gamblers are classified as at-risk of developing problems related to their gambling behaviour (Gupta & Derevensky, 1998a; Shaffer & Hall, 1996, 2001). Shaffer (2000) noted that, when compared to adults, the higher rates of adolescent problem gambling are similar to the pattern of higher rates of substance abuse among adolescents, suggesting that it may be an adolescent-limited problem (see Moffitt, 1993). On the other hand, the difference between adult and adolescent prevalence rates may be due to the different cut-off point for classification of problem gambling between adolescent and adult assessment tools. For example, with the South Oaks

Gambling Screen for Adults, adults are classified as problem gamblers if they report a minimum of five negative consequences associated with gambling. In contrast, the adolescent classification system requires only four negative consequences, although frequency of involvement also is included.

Much of the gambling literature tends to focus on problem gambling. Derevensky and Gupta (2000a) found that, among adolescents, between 12.7% and 46.5% reported experiencing at least one negative consequence related to their gambling in the past 12 months. In addition, the authors found that a gambling preoccupation is the most frequently reported consequence followed by chasing losses and lying about gambling activities. Adolescents who gambled frequently also reported higher rates of poor school performance, legal problems, and loss of interest in normal activities compared to non-gambling adolescents (Griffiths, 1995; Winters, Stinchfield, & Fulkerson, 1993b). The challenge with many of these studies, however, is that because there is a lack of prospective studies, the temporal relation between the onset of gambling behaviour and consequences cannot be determined (Winters & Anderson, 2000).

Abbott and Cramer (1993) found that adults who began gambling during their adolescence were more likely to participate in multiple gambling activities as adults than those who began gambling in adulthood. When compared to earlier prevalence studies, Carlson and Moore (1998) found that adolescents were beginning to gamble at an earlier age, possibly due to an increase in gambling opportunities. Research also has found that older adolescents tend experience more consequences than younger adolescents (Canadian Foundation on Compulsive Gambling, 1994; Fisher, 2000).

Gupta and Derevensky (1998b) found a small increase in gambling participation increased across grade 7, 9, and 11 students with grade 11 students reporting the most frequent gambling. With respect to problem gambling behaviour, The Canadian Foundation on Compulsive Gambling (1994) reported that 40% of adolescents between ages of 18 to 19 years, 35% of adolescents between the ages of 15 to 17 years, and 27% of the adolescents between the ages of 12 and 14 years had some gambling problems. Further, Fisher (2000) found significant age differences among adolescents aged 11 to 15 years in some dimensions of problem gambling (i.e., tolerance, loss of control, withdrawal, escape, and chasing losses). These findings suggest that there are differences in frequency of gambling and in problem gambling among younger and older students. This study, therefore, directly examines age differences in gambling by examining adolescents from 14 to 18 years of age.

Assessing Gambling Behaviour

There are differing opinions in the literature regarding how best to assess and classify gambling behaviours among adolescents (Derevensky & Gupta, 2000a; Ferris, Wynne, & Single, 1999; Wiebe, Cox, & Mehmel, 2000; Winters & Anderson, 2000). The commonly used tools are the South Oaks Gambling Screen – Revised for Adolescents (SOGS-RA) (Winters, Stinchfield, & Fulkerson, 1993a, 1993b), Diagnostic Statistical Manual-IV Adapted for Juveniles (DSM-IV-J) (Fisher, 1992), and the Gamblers Anonymous Twenty Questions (GA20). The DSM-IV-J has been found by Derevensky and Gupta (2000a) to be the most conservative measure. Winters and Anderson (2000) argue that very little validity data have been reported so it is difficult to make an assessment as to which of the three tools commonly used

provides the most accurate information. While the number of problem gamblers differs with the various assessment tools, DiClemente, Story, and Murray (2000) suggest that, regardless of assessment classification, adolescents who are regular gamblers are at high risk of developing problem gambling later in life. Within the literature, however, the most commonly used measure of problem gambling is the SOGS-RA (see Adlaf & Ialomiteanu, 2000; Derevensky & Gupta, 2000a; Ladouceur et al., 2000; Poulin, 2000, 2002; Vitaro et al., 1997, 1998; Winters, Stinchfield, Botzet, & Anderson, 2002). To allow for comparisons with the literature, therefore, the present study used the SOGS-RA to measure adolescent problem gambling.

Groups of Gamblers

Researchers tend to use the various assessment tools to differentiate among adolescents who are at different levels of risk for developing gambling problems (low risk, at-risk, problematic) (see Ferris, Wynne, & Single, 1999). Most of the interest among researchers examining gambling, however, has been centered on problem gamblers. While the prevalence of problem gambling among adolescents cannot be ignored, researchers have yet to focus on gaining a better understanding of four groups of adolescent gamblers (i.e., adolescents who do not gamble, adolescents who gamble at a non-problematic level, adolescents who gamble at an at-risk level and adolescents who gamble at a high-risk/problematic level). For example, it may be that the factors that predict recreational/low-risk gambling may be different from the factors that predict at-risk or problematic gambling. The determination of what factors differentiate among the varying levels of risk associated with gambling behaviour will be important for a better understanding of problem gambling and for

more effective early intervention programs. Therefore, the present study examines four groups of adolescent gamblers (no-risk/non-gamblers, low-risk/non-problematic gamblers, at-risk gamblers, and high-risk/problematic gamblers).

Some researchers use a narrow classification of problem gambling behaviour that considers only the number of consequences experienced by a person related to their gambling behaviour (e.g., Adlaf & Ialomiteanu, 2000; Derevensky & Gupta, 2000b). Other researchers use a broad definition for determining the levels of gambling. A broad definition takes into account both the frequency of gambling and the number of consequences a person experienced as a result of their gambling (e.g., Poulin, 2000; Vitraro, Arseneault, & Tremblay, 1997). There is little consistency, however, in the criteria used to classify low-risk, at-risk, and problem gamblers. For example, with respect to the classification of problem gamblers, some researchers who used a narrow classification system have used the reporting of three or more consequences to classify problem gamblers (Ladouceur, Bouchard, Rhéaume, Jacques, Ferland, Leblond, & Walker, 2000). In contrast, other researchers used the reporting of four or more consequences to classify adolescents as problem gamblers (Adlaf & Ialomiteanu, 2000; Derevensky & Gupta, 2000b). Researchers who used a broad classification system also varied in their definition of problem gamblers. Some researchers included as problem gamblers those participants who reported gambling weekly and who reported two or more consequences (Poulin, 2000, 2002) while other researchers classified those participants as at-risk gamblers (Winters et al., 2002). Given this diversity in approaches and the finding by DiClemente, Story, and Murray (2000) that it is important to consider the frequency of involvement in a risk

behaviour when determining problem behaviour, the present study used a broad classification system taking into account both frequency of gambling and the number of consequences reported to classify participants into four groups of gamblers (no-risk/non-gamblers, low-risk/non-problematic gamblers, at-risk gamblers, and high-risk/problematic gamblers).

A gender difference related to problem gambling has been identified in the literature. Derevensky and Gupta (2000a) cite a gender difference for pathological gambling of between 8 and 11% for samples of male gamblers and between less than 1 and 3.5% for samples of female gamblers, depending on the tool used. This difference is not simply a matter of males being more likely than females to gamble, as these percentages are based on a sample of male and female gamblers, not the entire population. The different percentage of problem gamblers across gender may be due to the tools being more effective at identifying male problem gambling behaviour than female problem gambling behaviour (Derevensky & Gupta, 2000a; Ferris, Wynne, & Single, 1999). Ferris, Wynne, and Single (1999) argue that less information on tool validity is available for females so the accuracy in detecting female problem use is uncertain and may be the reason that gender differences frequently are found.

Efforts to validate these tools, with both genders, increasingly are being seen in the literature (Derevensky & Gupta, 2000a; Ferris & Wynne, 2001; Fisher, 2000; Ladouceur et al., 2000; Poulin, 2002). Poulin (2002) examined the often used cut-off point of a score of four or more on the SOGS-RA in relation to male and female problem gamblers. She found that using a cut-point of four or more resulted in 26%

of the male daily gamblers and only 9% of the female daily gamblers being classified as problem gamblers. These findings suggest that the validity of the SOGS-RA may differ by gender. Therefore, it is uncertain if the gender difference in problem gambling is related to actual differences in behaviour or if it is a measurement issue.

Relation of Gambling to Other Risk Behaviours

Some attention also has been paid to the interrelations among adolescent problem behaviours such as substance use and delinquency (Ary, Duncan, Cuncan, & Hops, 1999; Donovan & Jessor, 1985; Fergusson, Lynskey, & Horwood, 1996; Smith, Canter, & Robin, 1989; Vingilis & Adlaf, 1990). Much of this work has been based on the concept of a 'problem behaviour syndrome' initially proposed by Jessor and Jessor (1977) to explain inter-correlations among several behaviours, including smoking, alcohol use, marijuana, delinquency, and sexual activity. Problem behaviour syndrome theory suggests that there is a clustering of behaviours that are commonly found to co-occur among adolescents, for example, smoking, alcohol use, marijuana use, and sexual activity. Only recently have studies explored both substance use and gambling involvement in the same study (Stinchfield, 2000; Winters & Anderson, 2000).

Researchers have found that problem gamblers are at a higher risk of developing other addictions such as substance use (Gupta & Derevensky, 1998a, 1998b, 2001; Vitaro et al., 1998). In these studies, a positive relation was found between gambling and both substance use and delinquency (Barnes, Welte, Hoffman, & Dintcheff, 1999; Gupta & Derevensky, 1998a; NRC, 1999; Stinchfield, 2000; Vitaro, Brendgen, Ladouceur, & Tremblay, 2001; Winters, Stinchfield, & Fulkerson,

1993b). It also has been found that the likelihood of gambling increases as a function of drug use (Winters & Anderson, 2000).

There is a methodological problem, however, with many of these studies. Many studies consider lifetime use of alcohol when looking at relations while others are more stringent and consider weekly or more frequent use of substances (Winters & Anderson, 2000). When researchers consider lifetime use of alcohol, a substance used at least once by the vast majority of the population, it does not take into account whether alcohol use occurred only once or on a regular basis and may inflate the relation between alcohol use and gambling. The variability in assessment procedures, therefore, does not allow for comparison between studies. It also is not known how or if substance use, gambling, and delinquency influence each other beyond the co-occurrence of these behaviours (Vitaro et al., 2001).

It is clear that more research is needed not only on gambling behaviour, but on gambling involvement in relation to other risk behaviours. In the present study, gambling behaviour was examined in relation to co-occurring participation in nine other risk behaviours (including alcohol, smoking, marijuana, hard drug, direct and indirect aggression, major and minor delinquency, and sexual activity).

Purpose of Present Study

Some researchers have argued that gambling is part of normative experimentation in adolescence (Winters & Anderson, 2000; Winters, Stinchfield, & Fulkerson, 1993b) and have focused primarily on problem gambling. To extend the understanding of adolescent gambling, this study examines the continuum of involvement in gambling as it may be that the factors that predict no-risk/non-

gamblers and recreational/low-risk gambling may be different from the factors that predict at-risk or problematic gambling. In addition, researchers to date have examined only a small number of predictors of adolescent gambling drawn primarily from the substance abuse literature (e.g., Gupta & Derevensky, 1998b, 2001). A comprehensive, integrated set of predictors has yet to be included in one study. The present study is the first to examine simultaneously a wide range of variables from a variety of contexts and to examine which of these variables discriminates among four groups of gamblers (no-risk/non-gamblers, low-risk/non-problematic gamblers, at-risk gamblers, and high-risk/problematic gamblers).

In addition, according to Problem Behaviour Theory (Jessor & Jessor, 1977), problem behaviours may co-occur during adolescence. This theory, however, often has been examined with only a small number of risk behaviours and rarely has this examination included gambling (Ary, Duncan, Cuncan, & Hops, 1999; Smith, Canter, & Robin, 1989). Recently, there has been a focus on the co-occurrence of gambling behaviour with substance use (primarily alcohol) or delinquency (Barnes et al., 1999; Gupta & Derevensky, 1998a; NRC, 1999; Stinchfield, 2000; Vitaro et al., 2001; Winters et al., 1993b). In the present study, levels of risk associated with gambling behaviour were examined in relation to levels of risk associated with nine other risk behaviours (including alcohol use, smoking, marijuana use, hard drug use, direct and indirect aggression, major and minor delinquency, and sexual activity).

Past research has found age (Canadian Foundation on Compulsive Gambling, 1994; Fisher, 2000; Gupta & Derevensky, 1998b) and gender differences (Govoni, Rupcich & Frisch, 1996; Gupta & Derevensky, 1998b, 2001; Ladouceur, Dube, &

Bujold, 1994) with respect to gambling involvement. Given these findings, for the present study, age and gender comparisons were conducted for all analyses.

In summary, the purposes of the present study were four fold: a) to examine the prevalence and consequences associated with adolescent gambling; b) to examine the factors which are associated with adolescent gambling; c) to determine what factors discriminate among four groups of gamblers (non-gamblers, low-risk gamblers, at-risk gamblers, and high-risk/problematic gamblers); and, d) to examine the relation of gambling to other risk behaviours.

Research Questions

The following questions outline the specific issues that are addressed in this study.

Prevalence of Adolescent Gambling Behaviour and Gambling Consequences

a. What is the prevalence of overall gambling and gambling consequences among adolescents (by age and gender)?

b. What is the prevalence of specific gambling activities (by age and gender)?

c. What is the prevalence of specific gambling consequences (by age and gender)?

Predictors of Adolescent Gambling Behaviour

a. Which variables within the neighbourhood, school, family, peer and intrapersonal domains best predict overall frequency of gambling?

Distinguishing Among Groups of Adolescent Gamblers

a. What is the prevalence of each gambling group (by age and gender)?

b. Does the type of gambling activity differ depending on the gambling group?

c. Do the types of gambling consequences differ depending on the gambling group?

d. Which variables within the neighbourhood, school, family, peer and intrapersonal domains best discriminate among the four groups of gamblers?

Relation of Adolescent Gambling Behaviour to Other Risk Behaviours

a. Is gambling related to other risk behaviours (by age and gender)?

METHOD

Participants

Participants in the present study were part of a larger study conducted by the Youth Lifestyle Choices: Community-University Research Alliance (YLC-CURA) designed to examine youth resilience and lifestyle choices in areas such as substance use, aggression, gambling, sexual activity, physical activity, and academic achievement. The participants were recruited from 25 secondary schools encompassing a school district in a southern Ontario region in Canada. The larger study consisted of a total of 7,430 participants (3,311 males and 3,447 females) who ranged in age from 14 to 18 years (M = 15.7 years, SD = 1.4 years). Ninety-one percent of the adolescents were born in Canada and the most common ethnic backgrounds reported other than Canadian were British (18.1%), German (15.0%), French (12.7%), and Italian (10.5%), consistent with the broader Canadian population (Statistics Canada, 2003). Data on socioeconomic status indicated a mean of 3.01 (SD = 1.34) for mother's level of education and 3.07 (SD = 1.42) for father's level of education, with 3 indicating some college, university or apprenticeship program and 4 indicating completion of a college/apprenticeship/technical diploma. The modal response for each parent was 2.00 indicating completion of high school. Further, 68.8% of participants were living in two-parent households (57.4% with both birth parents, 11.4% with one birth parent and one step-parent), 15.1% reported living with a single parent (usually mother), and the remaining adolescents reported living with relatives (1.4%) , guardians (0.8%), on their own (0.7%), adoptive parents (0.6%),

foster parents (0.4%), with roommates (0.3%), in group homes (0.3%), or other (3.9%). Missing data accounted for the remaining 7.7% of responses.

Participants who completed a minimum of 50% of the gambling questions (51% of the original sample, N=3,767) were included in the present study. Given that gambling was the dependent measure of interest, the reduced number of participants was selected to ensure that a minimum amount of data was imputed, thereby increasing confidence in the results. The large amount of missing data was due to the fact that the gambling questions were placed near the end of the survey and many students may not have had enough time to complete the survey. The participants in the reduced sample (1,722 males and 2,045 females) ranged in age from 14 to 18 years (M = 15.8 years, SD = 1.4 years). Ninety-four percent of the participants were born in Canada and the most common ethnic backgrounds reported other than Canadian were British (19.4%), German (14.7%), French (11.9%), and Italian (10.0%) consistent with the pattern found in the larger sample. Data on socioeconomic status indicated a mean of 3.07 (SD = 1.45) for mother's level of education and 3.14 (SD = 1.53) for father's level of education, with 3 indicating some college, university or apprenticeship program. The modal response for each parent was 2.00 indicating completion of high school. Further, 78.7% of participants were living in two-parent households (66% with both birth parents, 12.7% with one birth parent and one step-parent), 17.5% reported living with a single parent (usually mother), and the remaining adolescents reported living with relatives (1.7%), on their own (0.8%), guardians (0.7%), adoptive parents (0.7%), foster parents (0.4%), with

roommates (0.3%), in group homes (0.3%), or other (4.2%). The percentages add to more than 100% as 6.5% of the students provided multiple responses.

Measures

In a review of theories and empirical studies of adolescent substance use, Petraitis et al. (1995, 1998) summarized common predictors of substance use. These predictors were used as a guide for the development of the questionnaire. Included in this study were 56 predictor variables and ten risk behaviours (smoking, alcohol, marijuana, hard drugs, sexual activity, direct aggression, indirect aggression, major delinquency, minor delinquency, and gambling). Measures were drawn from a variety of contexts (e.g., school, neighbourhood, family, peer, intrapersonal) to ensure that a comprehensive examination of potential predictors of gambling behaviours across contexts would be possible within one study. For a summary of measures, see Appendix A. For a list of specific questions, see Appendix B. Reliability for all measures was determined using raw scores. As much as possible, existing scales exhibiting good psychometric properties were used. The larger survey, however, was developed in consultation with YLC-CURA members (i.e., school board personnel, principals, teachers, parents, community agency staff, and youth). Efforts were made by these members to make the survey as positive as possible. Therefore, for some scales, the categories were reversed so that the more positive category was first (e.g., the never category was used first for the question "How often have you done these things during the last school year"). In addition, some questions were deleted and others were modified for ease of interpretation for students. These modifications to

the existing scales are outlined below and deleted questions from existing scales can be found in Appendix C.

Demographics

Participants were asked to indicate their age, gender, ethnic background, and living situation for demographic purposes. Ethnic background was assessed by the question "Other than Canadian, is there another culture or ethnic background that your family belongs to?" The response categories for this question were developed based on the top ten ethnic populations reported in the 1996 census data for the southern Ontario region from which the sample was drawn. Participants' living situations were assessed by the question "With whom do you live right now?"

Background

Five questions were used to identify participants with a high-risk background. Participants were classified as having a high-risk background if they indicated they had previously been abused (Dodge & Pettit, 2003; Maxfield & Widom, 1996), OR if their mother had been a teenage mom (Furstenberg, Brooks-Gunn, & Chase-Lansdale, 1989), OR if they had been in foster care (Jessor, Turbin, & Costa, 1998), OR if their parents were receiving social assistance (Jessor, 1993; Jessor et al., 1998), OR if either of their parents had an alcohol or drug problem (Das Eiden, Peterson, & Coleman, 1999). To calculate whether a participant's mother was a teenage mom, the participant's current age was subtracted from the mother's current age. If a participant did not meet any of the five criteria for being classified as having a high risk background (coded as 1), they were classified as having a low risk background (coded as 0).

Temperament

Temperament was assessed using a modified version of The Dimensions of Temperament Scale – Revised (DOTS-R, Windle & Lerner, 1986), a 54-item scale with 11 different subscales (i.e., activity level general, activity level sleep, approach/withdrawal, flexibility/rigidity, mood, rhythmicity/sleep, rhythmicity/eating, rhythmicity/daily habits, task orientation, distractibility, persistence). The subscale of task orientation is a combination of the subscales distractibility and persistence. The DOTS-R was validated with an adolescent population (Windle & Lerner, 1986). Cronbach's alpha for the subscales ranges from .74 to .89 (Windle & Lerner, 1986).

Several modifications were made to the original scale. First, the response scale was changed from *usually false, more false than true, more true than false, usually true* to *almost always or always, often, sometimes, almost never or never.* Second, the DOTS-R was reduced to two sections of 12 questions each and only 7 of the subscales were used (i.e., general activity level, approach/withdrawal, flexibility/rigidity, rythmicity/sleep, mood, distractibility, and persistence). Third, for some questions, wording was changed. Modifications are outlined as follows:

Activity Level General Subscale

Three items assessed participants' general activity level and were averaged to form a composite measure. The YLC-CURA changed "I can't stay still too long" to "I have a hard time sitting still" and "I get very restless" to "I get fidgety." Lower scores indicated higher general activity level. For this sample, Cronbach's alpha was .79.

Approach/Withdrawal Subscale

Five items assessed participants' openness toward new situations and were averaged to form a composite measure. The YLC-CURA made changes to the wording of four questions: (1) "I usually move toward new objects shown to me" to "I am interested in new object"; (2) "I move towards new situations" to "I like trying new things"; (3) "is to move my head toward it" to "is to be interested in it"; and (4) "On meeting a new person I tend to move toward him or her" to "I like meeting new people." Lower scores indicated more approachability. For this sample, Cronbach's alpha was .65.

Flexibility/Rigidity Subscale

Two items assessed participants' flexibility toward change and were averaged to form a composite measure. The YLC-CURA changed the wording in the questions from "a new thing in the home" to "things at home" and from "I resist changes in routine" to "I do not like changes." Lower scores indicated a more flexible behavioural style. For this sample, Cronbach's alpha was .36. Given the low reliability of this subscale, this measure was dropped from the analyses.

Rhythmicity/Sleep Subscale

Four items assessed participants' sleep patterns and were averaged for a composite measure. The YLC-CURA changed "I usually get the same" to "I get the same" and added a question not from the DOTS-R, "I have trouble getting to sleep each night." Lower scores indicated more regularity of sleeping behaviour. For this sample, Cronbach's alpha was .58.

Mood Subscale

Four items assessed participants' general mood and were averaged for a composite measure. The YLC-CURA made no wording changes to the mood subscale questions. Lower scores indicated a more positive quality of mood. For this sample, Cronbach's alpha was .85.

Distractibility Subscale

Four items assessing participants' distractibility were averaged for a composite measure. The YLC-CURA changed "I am involved in a task" to "doing something", "I can always be" to "I can be", and "occurring" to "happening." Lower scores indicated less distractibility. For this sample, Cronbach's alpha was .53.

Persistence Subscale

Three items were averaged for a composite measure of participants' persistence in tasks. The YLC-CURA changed "I persist at a task until it's finished" to "when I do things, I do them until they are finished" and "Once I take something up, I stay with it" to "Once I start something, I finish it." Lower scores indicated higher persistence. For this sample, Cronbach's alpha was .68.

Parental Education

Education Levels of Mothers and Fathers

Participants were asked to indicate their mother or female guardian's and father or male guardian's education level. Education level was assessed by the question "What is the highest level of education your mother/stepmother (female guardian) completed?" and was measured on a six-point scale ranging from *did not finish high school* to *completed a professional and/or graduate degree.* Higher scores

indicated higher level of completed education. The measures of mother's and father's education level were correlated at .51.

Neighbourhood Quality

Six items assessed neighbourhood quality using questions from Health Canada's Community Action Programs for Children (CAP-C) national evaluation of the Brighter Futures programs (see web site capc-cpnp@www.hc-sc.gc.ca). The purpose of this scale was to assess the degree of cultural or racial acceptance in students' neighbourhoods, whether or not children had a place to play in that neighbourhood, and the extent to which students felt safe in their neighbourhood.

The YLC-CURA deleted the first question from the original scale. Participants responded to five questions on a five-point Likert scale ranging from *strongly disagree* to *strongly agree*, where higher scores indicated a safer and cleaner neighborhood. Items were averaged to form a composite score for participants' perception of neighbourhood quality. For this sample, Cronbach's alpha for these items was .66.

Substance Availability

Substance availability was assessed through two measures: substance availability in the neighbourhood and in the school.

Substance Availability in the Neighbourhood and in the School

Four items assessed students' perceptions of how available alcohol, cigarettes, marijuana, and other illegal drugs were in a persons' neighbourhood and four items assessed the students' perception of how available these substances were in their school. Participants answered the questions on a four-point Likert scale ranging from

almost never or never to *almost always or always*. Items were averaged to form a composite score. Higher scores indicated more perceived availability. Cronbach's alpha for the neighbourhood items was .93 and for the school items was .86. The correlation between substance availability in their neighbourhood and substance availability in their school was .62.

School Culture

School culture was assessed using a modified version of the School Climate Survey developed for a senior elementary and high school population (Kelly, Glover, Keefe, Halderson, Sorenson, & Speth, 1986), a 55-item scale with 10 sub-scales (i.e., security and maintenance, parent and community-school relationships, guidance, student-peer relationships, student teacher relationships, administration, instructional management, student academic orientation, student behavioural values, and student activities). This scale assessed different aspects of school environment that influence students' behaviour and perceptions of that school such as guidance, student-peer relationships teacher-student relationships, academic motivation of students, student relationships, attitude of students toward each other and their school, degree of instruction and guidance from teachers in the classroom setting, and how trouble-free it was for students to participate in extracurricular activities regardless of their background.

The YLC-CURA made the following modifications to the original scale. Not included in the study were: four subscales (security and maintenance, parent and community-school relationships, guidance, student-peer relationships), two questions from the instructional management sub-scale, one question from the student activities

sub-scale, and one question from the administrative subscale. In addition, the YLC-CURA changed the wording to "most" teachers/students, "this school" to "my school", "scold them" to "get angry with them", and dropped the *don't know* category.

The 30-item scale included a five-point Likert scale ranging from *strongly agree* to *strongly disagree*. All subscales were combined to form an average school culture score. Higher scores indicated poorer quality school culture. Cronbach's alpha for these items was .93.

Parental Monitoring

Parental monitoring was assessed with two measures: curfew and parents asking about activities.

Curfews

Curfew was assessed by two questions: "In a typical week, what is the latest you can stay out on school nights?" and "What is the latest you can stay out on weekends?" Responses were assessed on a nine-point scale ranging from *not allowed out* to *as late as I want*. Scores were averaged to form a composite measure. Higher scores indicated a later curfew. The two curfew questions were correlated at .65.

Parent's Asking About Activities

A set of nine questions assessed how often parents ask about participant's activities such as where they go at night, what they do with their free time and what web sites they look at on the Internet. Parental inquiry of participant's activities was assessed on a four-point scale ranging from *I tell them without their asking* to *they never ask*. Scores were averaged to form a composite score. Higher scores indicated less inquiry about participant's activities. Cronbach's alpha was .81.

Relationship with Parents

Relationship with parents was assessed with four measures: attachment to mother, attachment to father, time spent with parents, and parental knowledge of participant's activities.

Attachment to Mother and to Father.

Parental attachment was assessed by a modified version of a 25-item scale developed by Armsden, Gay, and Greenberg (1987) for an adolescent population. The questions were separated into two sections: questions specific to the student's mother or female guardian and questions specific to student's father or male guardian. These questions were developed to assess students' perceptions of positive and negative aspects of relationships with their parents and how well these parental figures serve as sources of psychological security. The original scale included three sub-scales which measured the degree of trust, communication, and alienation in their relationship with their parents. Cronbach's alpha for the original scale was .87 for mother attachment and .89 for father attachment (Armsden, Gay, & Greenberg, 1987).

The YLC-CURA modified the scale by removing four questions from the trust sub-scale and four questions from the communication subscale resulting in 17 questions for each parent. In addition, the original five-point Likert scale was changed to a four-point scale ranging from *almost always or always* to *almost never or never*. Scoring was conducted by weighting each subscale to account for the eight deleted questions, summing the trust and communication raw scores, and subtracting the alienation raw score to create an overall attachment score. Higher scores indicated a poorer quality relationship with parents. For this sample, Cronbach's alpha was .84

for mother attachment and .93 for father attachment. Mother attachment and father attachment were correlated at .56.

Time Spent with Parents

Time spent with parents was assessed by two questions developed by the YLC-CURA, "My parents/guardians spend time just talking with me" and "My family does something fun together." Both items were assessed on a four-point scale ranging from *almost every day* to *almost never*. Higher scores indicated less fun with parents and less time spent talking with parents. These two items were correlated at .46.

Parental Knowledge of Participant's Activities

A set of nine questions assessed how much parents really knew about participant's activities such as where they go at night, what they do with their free time and what web sites they look at on the Internet. Parental knowledge of participant's activities was assessed on a four-point scale ranging from *they always know* to *they never know*. Scores were averaged to form a composite measure. Higher scores indicated less knowledge about participant's activities. Cronbach's alpha was .90.

Peer Victimization

Peer victimization was assessed using eight questions that examined how often a student had been the victim of bullying in the past school year (Marini, Spear, & Bombay, 1999). Four questions measured direct forms of physical and psychological victimization, including bodily harm, verbal, social, and emotional assault. Questions also examined indirect forms of victimization. These questions

included situations where a person dared another person to pick a fight with someone, or deliberately spread rumors about another person. The reliability of the scales for an early adolescent population ranged from .80 to .86 (Z. Marini, personal communication, November 18, 2001).

The YLC-CURA changed the wording of the questions to read, for direct victimization: been pushed and shoved; been sworn at and called names; been teased and ridiculed; and been kicked and hit. For indirect victimization the questions read: been excluded from joining an activity; received hurtful and unsigned notes; had rumours and untrue stories of you spread around; and had another student dare someone to hurt you. In addition, the YLC-CURA changed the response categories from a seven-point scale to a five-point scale ranging from *never* to *every day*.

Scores were averaged to form two composite measures (direct and indirect victimization). Higher scores indicated more frequent victimization. For this sample, the reliability of these items (four questions for each sub-scale) was .81 and .72 for direct and indirect victimization respectively. These two forms of victimization were correlated at .55.

Friendship Quality

Friendship quality was assessed with two measures: best friend quality and friendship quality.

Best Friend Quality

The original 46-item friendship scale was created by Bukowski, Hoza, and Boivin (1994) for an early adolescent population. The shortened 19-item scale by Gauze, Bukowski, Aquan-Asse, and Sippola (1996), however, was used in the YLC-

CURA questionnaire. In addition, three questions were included from the conflict subscale developed by Bukowski, Hoza, and Boivin (1994).

In this section students were asked to answer questions about their friends in general. These questions assessed five major aspects of friendship such as whether the friendship was mutual (the degree of companionship), the extent of conflict that existed between the two friends, being able to approach that friend for help (i.e., guidance and protection from victimization), security (having respect for each other or being able to rely on the each other), and the closeness of the relationship (strength of the bond between two friends, and how much of that is conveyed). Cronbach's alphas for the reduced version of the scale ranged from .66 to .77 (Gauze et al., 1996).

The YLC-CURA modified the original scale by changing the response categories from a four-point range of *not true* to *really true*, to *almost always, often, sometimes, almost never* or *never*. Four questions were deleted. All questions were changed from *friend* to *best friend*. Scoring was conducted by weighting each subscale to account for the missing items. Sub-scale items were summed for separate totals of each of the five dimensions of best friendship quality. The total of the conflict items was subtracted from the sum of the five other sub-scales for an overall score of friendship quality. A low score on the conflict subscale indicated high conflict. Higher composite scores indicated poorer best friendship quality. For this sample, the Cronbach's alpha for the 18 items was .91.

Friendship Quality

The original 25-item scale was developed by Armsden, Gay, and Greenberg (1987) for an adolescent population. These questions were developed to assess

students' perceptions of the positive and negative aspects of relationships with their friends in general (as opposed to best friend). The questions in this section examined three characteristics of friendship: trust, communication, and alienation. For the original scale, test-retest reliability was .86 and Cronbach's alpha was .92 (Armsden, Gay, & Greenberg, 1987).

The YLC-CURA modified the original scale by removing three questions from the trust sub-scale, three questions from the communication subscale, and one question from the alienation sub-scale. Wording changes were made in two questions. Question four changed the word "or" to "and" and question 12 was changed from "care about how I am" to "concerned about my well being." In addition, the original five-point Likert scale was changed to a four-point scale ranging from *almost always or always* to *almost never or never.*

Scoring was conducted by weighting each subscale to account for the missing items, summing the trust (6 items) and communication (5 items) raw scores and subtracting the alienation (6 items) raw score to create an overall friendship quality score. Higher scores indicated poorer friendship quality. For this sample, Cronbach's alpha for the 18 items was .94.

The composites of best friendship quality and general friendship quality were correlated at.79.

Sibling Risk Behaviour

The YLC-CURA created four questions to assess students' perceptions of how often their brothers or sisters drank alcohol, smoked cigarettes, smoked marijuana, or used other illegal drugs. Students' perceptions of sibling engagement in risk

behaviours were assessed on a four-point scale ranging from *almost never or never* to *almost always or always.* Scores were averaged to form a composite score with higher scores indicating more frequent engagement in risk behaviours. For this sample Cronbach's alpha was .83.

Academic Orientation

Academic orientation was assessed with seven measures: grades in school, educational goals, planfulness, boredom in school, and importance of academic achievement to self, friends, and parents. Items were used individually.

Grades

Participants were asked to indicate the typical grades that they received. Grades were assessed on a six-point scale ranging from *A+ (90% - 100%)* to *below 50%*, with higher scores indicating lower grades.

Educational Goals

Educational goals were assessed by a single item on a six-point scale ranging from *not finishing high school* to *obtaining professional training (e.g., Masters, PhD., medical doctor, lawyer, etc).* A *don't know* option also was provided. Higher scores indicated higher educational goals.

Planfulness

Participants were asked how often they planned ahead for the things they had to do each day. Planfulness was assessed on a four-point scale ranging from *always or almost always* to *never or almost never.* Higher scores indicated less planning ahead.

Boredom in school

Participants were asked how often they experienced boredom in school. Boredom was assessed on a four-point scale ranging from *all of the time* to *never or almost never*. Higher scores indicated lower level of boredom in school.

Importance of Academic Achievement

Three questions assessed students' perception of how important it was to friends, parents and self that the participant does well in school (adapted from Jessor & Jessor, 1977; Jessor, Graves, Hanson, & Jessor, 1968). Perceptions were assessed on a four point scale ranging from *very important* to *not at all important*. A *not sure* option also was provided. Higher scores indicated less importance. Items were used individually.

Religiosity

Religiosity was assessed with two questions: attendance at religious services and spirituality.

Attendance at Religious Services

Students were asked a single question regarding the frequency of church/synagogue/temple attendance in the last month. Attendance was measured on a five-point Likert scale ranging from *every day* to *never*. Higher scores indicated less frequent attendance at church/synagogue/temple.

Spirituality

Students were asked a single question regarding their degree of spirituality. Spirituality was measured on a three-point scale ranging from *yes* to *no*. Higher scores indicated less spirituality.

The correlation between church attendance and degree of spirituality was .73. Items were used individually.

Structured Activities

Structured activities were assessed with four questions: club participation in school, club participation in the community, sport participation in school and sport participation in the community. These questions were developed by YLC-CURA. Frequency of involvement in these activities was measured on a five-point Likert scale ranging from *every day* to *never*, with higher scores indicating less involvement in the activity. Items were used individually.

Correlation between club participation inside and outside of school was .29. Correlation between sports inside and outside of school was .42. Correlations among the four measures ranged from .06 (between sports outside of school and school clubs) to .42 (between sports inside of school and sports outside of school).

Well-being

Well-being was assessed with five measures: depression, social anxiety, self-esteem, life satisfaction, and daily hassles. These measures were used individually.

Depression

A modified version of The Centre for Epidemiological Studies Depression Scale (CES-D) (National Institute of Mental Health, 1972) was used to assess the degree of depressive symptoms students experienced over the past two weeks. Twenty questions focused on affective components such as depressed mood, feelings of guilt and worthlessness, feelings of helplessness and hopelessness, psychomotor retardation, loss of appetite, and sleep disorders. In the original scale, each question

used a 0-3 response scale with higher scores indicating greater depression. Reported reliability for the scale was .85 (Radloff, 1977).

The YLC-CURA modified the original scale by changing the response categories from *rarely or none of the time (less than 1 day), some or a little of the time (1-2 days), occasionally or a moderate amount of the time (3-4 days), and most or all of the time (5-7days)* to *none of the time (less than 1 day), rarely (1-2 days), some of the time (3-5 days), occasionally (6-9 days),* and *most of the time (10-14 days)*. In addition, wording was changed for three questions: question three changed "shake off the blues" to "stop feeling sad," question seven added "extra," and question 16 changed from "I could not get going" to "I felt like doing nothing." Scores were averaged to form a composite measure. Higher scores indicated more symptoms of depression. For this sample, Cronbach's alpha for the 20-items was .92.

Social Anxiety

The original 18–item scale was from Ginsburg, LaGreca, and Silverman, (1998) for adolescents. This scale had three subscales: social avoidance and distress, fear of negative evaluation, and social avoidance and distress-general. The first six-item subscale examined the degree to which students felt anxious or uncomfortable in social situations and how this affected a student's willingness to engage in new social situations. The second eight-item subscale assessed how much a student worried about being perceived negatively by their peers. The third four-item subscale assessed the degree of general anxiety experienced when involved in social situations. Cronbach's alphas for the subscales were .74, .90, and .60 for social avoidance and

distress-new, fear of negative evaluation, and social avoidance and distress-general, respectively (Ginsburg et al., 1998).

The YLC-CURA modified the original scale by changing the response categories from a four-point scale ranging from *strongly agree* to *strongly disagree* to a four-point Likert scale ranging from *almost never or never* to *almost always or always*. Four questions were deleted. In addition, the word "kids" was changed to "other people my age" and in question 13 the word "play" was changed "to hang out." Scores on the remaining 14-items were averaged to form a composite score of social anxiety. Higher scores indicated greater social anxiety. Cronbach's alpha for this sample was .93.

Self-Esteem

The Rosenberg Self-Esteem Scale (Rosenberg, 1965) was used to measure global self-esteem with an emphasis on factors such as personal worthiness, appearance, and social competence. In the original scale, participants responded to fourteen questions on a four-point Likert scale ranging from *strongly disagree* to *strongly agree* and items were summed for an over-all self-esteem score. Cronbach's alpha for the original scale was .92 (Rosenberg, 1979, 1965). This scale has been validated with an adolescent population (Sibert & Tippett, 1965).

The YLC-CURA modified the original scale by adding another response category, *neither agree nor disagree*. Wording changes were made for two questions: question seven changed "could have more respect for myself" to "could like myself more" and question eight changed "am inclined" to "I tend." Scores were averaged to

form a composite self-esteem score. Higher scores indicated poorer self-esteem. For this sample, Cronbach's alpha for the 14 items was .93.

Life Satisfaction

This question was taken from the Youth Leisure Study (Yardley, 1999). This question measured the participants' degree of life satisfaction. Participants responded to the question on a four-point Likert response scale ranging from *almost always or always* to *almost never or never.* A higher score indicated lower life satisfaction.

Daily Hassles

Participants were asked to provide information on how often daily hassles, such as not having enough money or problems with a boyfriend/girlfriend, bothered them. Participants responded to the 25 questions on a three-point Likert scale with anchors of *almost never bothers me*, sometimes *bothers me,* and *often bothers me.* Response scores were averaged to form an over-all daily hassles score, with higher scores indicating a greater intolerance of daily hassles. For this sample, Cronbach's alpha was .72.

Unstructured Activities

Various unstructured activities were assessed with four measures: skipping class, attendance at parties, hanging out with friends, and dating.

Skipping Class

Participants were asked a single question to assess the frequency of skipping classes during a typical month. Frequency was assessed on a five-point scale ranging from *6 or more times* to *never*, with a higher score indicating less frequent skipping.

Partying

Participants were asked a single question to assess the frequency of attendance at parties during the last month. Frequency was assessed on a five-point scale ranging from *every day* to *never*, with a higher score indicating less frequent attendance at parties.

Hanging Out with Friends

Participants were asked a single question to assess the frequency of hanging out with friends during the last month. Frequency was assessed on a five-point scale ranging from *every day* to *never*, with a higher score indicating less frequent hanging out with friends.

Dating

Participants were asked a single question to assess the frequency of dating during the last month. Frequency was assessed on a five-point scale ranging from *every day* to *never*, with a higher score indicating less frequent dating.

Risk Attitudes/Perceptions

Risk attitudes/perceptions were assessed with five measures: how upset parents would be about one's risk-taking, how upset friends would be about one's risk-taking, how wrong/intolerance of deviance, riskiness for self to engage in risk behaviours, and riskiness for others to engage in risk behaviours.

Parents and Friends Upset by One's Risk Behaviours

Students' perceptions of how upset they thought their parents/guardians and friends would be if they were to engage in six different risk behaviours (dieting constantly, drinking alcohol, smoking cigarettes, smoking marijuana, using other

illegal drugs, having sex) was assessed using a four-point Likert scale ranging from *very upset* to *not at all upset*. Scores were averaged for a composite measure of perceptions toward risk-taking behaviour with higher scores indicating that the parent/guardian or friend would be less upset by a students' risk-taking behaviour. For this sample, Cronbach's alpha for parents upset by one's risk-taking behaviour was .79. Cronbach's alpha for friends upset by one's risk-taking behaviour was .89. The correlation between "parents upset" and "friends upset" was .48.

How Wrong/Intolerance for Deviance

Participant's general attitudes and beliefs about right and wrong were assessed using the Attitudinal Intolerance of Deviance Questionnaire created by Jessor and Jessor (1977) for adolescents. Eleven questions dealt with issues such as cheating on a test, giving a fake excuse to a teacher or employer, or borrowing small amounts of money without the intent of paying it back. Cronbach's alpha for the original scale was .90 (Jessor, Turbin, & Costa, 1998).

The YLC-CURA changed the original nine-point Likert scale to a four-point Likert-scale ranging from *very wrong* to *not at all wrong*. In addition, wording changes to the questions were made. Question three was changed from "to cause a disturbance" to "bother people," question five deleted the phrase "by using hidden notes or by some other way," question six changed "legitimate" to "good," question eight changed "out of spite" to "to get even," and all references to employer and work were removed. Items are averaged for an overall score, with higher scores indicating lower attitudinal intolerance. For this sample, Cronbach's alpha was .89.

Riskiness of Engagement in Risk Behaviours for Self and Others

Participants' perceptions of how risky it would be for themselves and for others to engage in seven different behaviours (being different from their friends, dieting constantly, drinking alcohol, smoking cigarettes, smoking marijuana, using other illegal drugs, having sex) were assessed on a five-point Likert scale ranging from *very high* to *very low*. Individual scores were averaged to form a composite score. Higher scores indicated lower perceived risk. For this sample, Cronbach's alpha for riskiness for self was .84 and the reliability for riskiness for others was .88. The correlation between riskiness for self and riskiness for others was .52.

Risk Behaviours

Ten risk behaviours were assessed: gambling, alcohol use, smoking, marijuana use, hard drug use, sexual activity, direct aggression, indirect aggression, major delinquency, and minor delinquency.

Gambling

Activities.

Participants were asked to indicate their involvement in eight gambling activities (i.e., playing cards for money, playing pokemon for keeps, buying a raffle or lottery ticket, betting on a sporting event, entering draws, going to bingos, betting on horse races and going to the casino) to assess the frequency of gambling during the past month. Frequency was assessed on a five-point scale ranging from *never* to *every day*. Scores were averaged to form an overall gambling score with higher scores indicating more frequent gambling. For this sample, Cronbach's alpha was .83. Correlations among the activities ranged from .23 to .68.

Consequences.

The original 12-item South Oaks Gambling Screen – Revised for Adolescents (SOGS-RA) (Winters et al., 1993a,1993b) was adapted to include six questions that examined the frequency of consequences that may occur as a result of gambling behaviour in the past 12 months. For example, questions asked participants if they had spent more money than was intended on gambling, if they had ever tried to win back lost money, if they had ever tried but could not stop gambling, if they had ever had arguments with family or friends because of the money they spent on betting or gambling, if they had ever borrowed money to bet and not paid it back, and if they had ever felt unhappy about the amount they bet or about what happened when they gambled.

In addition to reducing the number of items in the scale, the response categories were changed from *yes/no* to *never, sometimes, most of the time, every time*. Question scores were summed for an over-all gambling problem score, with higher scores indicating greater frequency in gambling consequences. For this sample, Cronbach's alpha was .88. The six consequences were correlated between .39 and .69.

Alcohol Use

Three questions were used to assess alcohol use behaviour. Participants were asked to indicate whether they had ever had a drink of alcohol, even a sip or two and if they had had a drink of alcohol, whether it was more than a sip or two. The quantity of alcohol use was assessed by one question from the Ontario Student Drug Use Survey 1977-1997 (Adlaf, Ivis, & Smart, 1997). Participants were asked about

the amount of alcohol they usually drank. Specifically, participants were asked, "On average, when you are drinking alcohol, about how many drinks do you have?" Six response categories ranged from *less than one* to *over 10*. Higher scores indicated consumption of more alcohol.

Smoking

Three questions were used to assess smoking behaviour. Participants were asked if they had ever tried cigarette smoking, even one or two puffs and if they answered yes, they were asked if they had ever smoked a full cigarette. For those participants who reported previous experience with smoking cigarettes, a single question from the Niagara Young Adult Health Survey (Sadava, 1987) was used to assess the number of cigarettes usually smoked each day. Quantity was assessed on an eight-point scale ranging from *I no longer smoke* to *more than a pack*. A higher score represented a higher number of cigarettes smoked each day.

Marijuana Use

A single question from the Niagara Young Adult Health Survey (Sadava, 1987) was used to assess the frequency of marijuana use in the past year. The scale of the original question was modified from a four-point scale to a six-point scale ranging from *never* to *every day*. A higher score represented more frequent engagement in marijuana use.

Hard Drug Use

Five questions assessing the frequency of hard drug use in the past year were from the Niagara Young Adult Health Survey (Sadava, 1987). One additional question on club drugs (e.g., ecstasy) was added to the scale to reflect drug use in

today's population. The four-point scale of the original scale was changed to a six-point scale ranging from *never* to *every day*. Students were asked to indicate the frequency at which they used each of six substances (e.g., cocaine, stimulants, depressants, heroin, acid, and club drugs such as ecstasy). Individual scores were averaged to form a composite score. Higher scores indicated more frequent engagement in hard drug use. For this sample, Cronbach's alpha for these six items was .92.

Sexual Activity

Sexual activity was assessed with three questions (i.e., the frequency of touching another person's private parts, touching another person's private parts with their mouth, and having sexual intercourse) on a six-point scale ranging from *never* to *every day*. Individual scores were averaged to form a composite score. Higher scores indicated more frequent engagement in sexual activity. For this sample, Cronbach's alpha was .93.

In addition, students who had indicated involvement in sexual intercourse, were asked how many people they have had intercourse with in the past month (five-point scale ranging from *1* person to *5 people or* more) and how often they used condoms in the last 12 months (five-point scale ranging form *always* to *never*). Higher scores indicated more sexual partners and less frequent condom use.

Direct Aggression

Direct aggression was assessed using four questions that examined how often a student had engaged in acts of bullying in the past school year (Marini et al., 1999). These questions measured direct forms of physical and psychological aggression,

including bodily harm, verbal, social, and emotional assault. The reliability of the scale for an early adolescent population ranges from .80 to .86 (Z. Marini, personal communication, November 18, 2001).

The YLC-CURA modified the original scale by changing the wording of the questions to read: pushed and shoved someone; sworn at someone and called them names; teased and ridiculed someone; and kicked and hit someone. In addition, the YLC-CURA changed the response categories from a seven-point scale to a five-point scale ranging from *never* to *every day*. Individual items were averaged to form a composite score. Higher scores indicated more frequent engagement in direct aggression. For this sample, Cronbach's alpha was .83.

Indirect Aggression

The original scale was from Marini et al., (1999). A set of four questions examined how often a student had indirectly bullied another person in the past school year. Questions addressed situations where a person dares another person to pick a fight with someone, or deliberately spreads rumors about another person. The reliability of the scale for an early adolescent population ranges from .80 to .86 (Z. Marini, personal communication, November 18, 2001).

The YLC-CURA modified the original scale by changing the wording of the questions to read: excluded someone from joining an activity; wrote hurtful and unsigned notes; spread rumours and untrue stories; and dared another someone to hurt someone. In addition, the YLC-CURA changed the response categories from a seven-point scale to a five-point scale ranging from *never* to *every day*. Individual items

were averaged to form a composite score. Higher scores indicated more frequent indirect aggression. For this sample, Cronbach's alpha was .77.

Major Delinquency

The YLC-CURA revised the Risk Involvement and Perception Scale (RIPS) (Shapiro, Siegel, Scovill, & Hays, 1998), used with late adolescents, to assess the frequency, in the past 12 months, of which a participant had engaged in three behaviours (joining a gang, carrying a gun as a weapon, carrying a knife as a weapon). Participants responded to these items on a four-point scale ranging from *never* to *more than 5 times*. Individual scores were averaged to form a composite score. Higher scores indicated more frequent involvement in major delinquency activities. For this sample, Cronbach's alpha was .71.

Minor Delinquency

The YLC-CURA revised the Risk Involvement and Perception Scale (RIPS) (Shapiro, Siegel, Scovill, & Hays, 1998), used with late adolescents, to assess the frequency that a participant had engaged in four behaviours (shoplifting, sneaking out at night, joyriding in a car and wrecking other people's property) in the past 12 months. Participants responded to these items on a four-point scale ranging from *never* to *more than 5 times*. Individual items were averaged to form an overall composite score. Higher scores indicated more frequent involvement in minor delinquency activities. For this sample, Cronbach's alpha for these items was .62.

Levels of Risk for Risk Behaviours

To differentiate among adolescents who are at different levels of risk for developing gambling problems, gambling participation was separated into four levels

of risk (no risk, low-risk, at-risk, or high-risk/problematic risk). These levels were based on gambling frequency and gambling consequences. For the remaining nine risk behaviours (i.e., alcohol smoking, marijuana use, hard drug use, sexual activity, direct aggression, indirect aggression, major delinquency, and minor delinquency) participants were classified into three levels of risk (no risk, at-risk or high risk). Only three levels were created because no information about consequences related to the nine risk behaviours was available. For comparison purposes in later analyses, three levels of risk also were created for gambling based on frequency alone.

Gambling

Three levels of risk.

Participants were classified into three levels of risk based on their involvement in gambling activities: no-risk (no involvement/non-gamblers), at-risk (some involvement), and high risk (high involvement). Participants indicating that they had never participated in any of the eight gambling activities in the past month were classified as no risk (no involvement). Participants who reported gambling less than once per week on all eight gambling activities were placed in the at-risk (some involvement) category (Poulin, 2000; Winters et al., 1993b, 2002). Participants who reported gambling weekly or more on at least one gambling activity were classified as high risk (high involvement) (Vitaro et al., 1998; Winters et al., 1993a, 2002).

Four levels of risk.

Participants were classified in one of four levels of gambling risk: no risk (non-gamblers), low risk, at-risk, and high risk. Youth who responded *never* to all eight gambling activities in the past month and never to all six gambling

consequences in the past year were classified as no risk (no involvement/non-gamblers). Gamblers then were classified as one of three levels of risk: low risk, at-risk, and high risk. The low risk gamblers were those students who reported gambling no more than weekly on any one gambling activity and who responded *never* on all six gambling consequences (Poulin, 2000). At-risk gamblers were those gamblers who reported gambling two times or more each week and experienced no consequences (Poulin, 2000) or who reported gambling no more than *2 times per week or more* and reported experiencing one consequence (Derevensky & Gupta, 2000; Poulin, 2000; Winters et al., 1993a) or who reported participating in any one gambling activity no more than monthly and reported experiencing two or three consequences (Adlaf & Ialomiteanu, 2000; Derevensky & Gupta, 2000; Ladouceur et al., 2002; Poulin, 2000; Vitaro et al., 1997, 1998; Winters et al., 1993b, 2000). High-risk gamblers were those students who reported experiencing four or more gambling consequences (Adlaf et al., 2000; Derevensky & Gupta, 2000; Poulin, 2000, 2002; Westphal, Rush, Stevens & Johnson, 2000; Wiebe, Cox, & Mehmel, 2000; Winters et al., 2002), or who reported participating in any one gambling activity daily (Poulin, 2000, 2002; Winters et al., 1993b), or who reported participating in any one gambling activity either *weekly* or *two times or more each week* and reported experiencing two or more consequences (Poulin, 2000, 2002; Winters et al., 1993b).

Alcohol Use

Participants were classified into three levels of risk based on their involvement in alcohol use: no-risk (no involvement), at-risk (some involvement), and high risk (high involvement). Participants indicating that they had never taken

more than a sip of alcohol were categorized as no risk (no involvement). The criterion for high-risk involvement was based on binge-drinking. Participants were categorized as high-risk involvement if they typically consumed *four or more drinks* per drinking occasion (Adalbjarnardottir & Rafnsson, 2001; Barnes et al., 1999; Chassin, Pitts, & Delucia, 1999; Ellickson et al., 1997; Hampson et al., 2001; Johnson & Richter, 2002; Newcomb & McGee, 1989; Osgood et al., 1988; Tucker et al., 2003; Vik, Cellucci, & Ivers, 2003; Wood, Read, Palfai, & Stevenson, 2000; Zweig, Dubersten Lindberg, & Alexander McGinley, 2001). All others were placed in the at-risk (some involvement) category.

Smoking

Participants were classified into three levels of risk based on their involvement with smoking: no risk (no involvement), at-risk (some involvement), and high risk (high involvement). Youth who had never smoked a full cigarette, and youth who no longer smoke were categorized as no risk (no involvement). Those who reported daily smoking, (i.e., at least one cigarette per day), were categorized as high-risk involvement (Adalbjarnardottir & Rafnsson, 2001; Burt et al., 2000; Duncan & Duncan, 1994; Ellickson et al., 1997; Johnson et al., 2002; Mayhew et al., 2000; O'Callaghan & Doyle, 2001; Poulin, 2000; Tucker et al., 2003; Windle & Windle, 2001; Young et al., 2002). All others, (i.e., those responding *I don't smoke every day*), were classified as at-risk (some involvement).

Marijuana Use

Participants were classified into three levels of risk based on their involvement with marijuana: no-risk (no involvement), at-risk (some involvement),

and high risk (high involvement). Youth who reported that they had *never* had any marijuana in the past 12 months were categorized as no risk (no involvement). High-risk involvement was defined as using marijuana a few times a month or more often (Benda & Corwyn, 1998; Brook et al., 1997; MacLean et al., 1999; Winters et al., 2002). All other responses (i.e., usage of *once* or *a few times a year*) were categorized as at-risk (some involvement).

Hard Drug Use

Participants were classified into three levels of risk based on their involvement with hard drugs: no risk (no involvement), at-risk (some involvement), and high risk (high involvement). Involvement was indicated by six items assessing frequency of use in the past 12 months for: cocaine/crack/crystal meth, uppers/beans/speed, downers/Valium, heroin/opium, acid/LSD/mushrooms, and Ectasy/roofies/special K/liquid ecstasy. Participants responding *never* for each hard drug were categorized as no risk (no involvement). High-risk involvement was defined as using any of the six substances more than once in the past year (Shaw et al., 1992; Winters et al., 2002; Wu et al., 2003). All other participants, (i.e., those using at least one of the six substances 'once' in the past year), were categorized as at-risk (some involvement).

Sexual Activity

Participants were classified into three levels of risk based on their involvement with sexual activity: no risk (no involvement), at-risk (some involvement), and high risk (high involvement). Participants were categorized as no risk (no involvement) if they had not engaged in sexual intercourse in the previous

year. High-risk involvement was defined as having sexual intercourse and not 'always' using condoms (Donenberg et al., 2002; Guo et al., 2002; Johnson et al., 2002; Parsons et al., 2000; Romer & Stanton, 2003; Stueve et al., 2001; Taylor-Seehafer & Rew, 2000; Tubman et al., 2001). Youth who had had sexual intercourse with more than one partner in the previous month also were categorized as high-risk (Guo et al., 2002; Tapert et al., 2001; Taylor-Seehafer & Rew, 2000). All other youth reporting some frequency of sexual intercourse were classified as at-risk (some involvement).

Minor Delinquency

Participants were classified into three levels of risk based on their involvement in minor delinquency: no risk (no involvement), at-risk (some involvement), and high risk (high involvement). Four items were used as indicators of involvement in minor delinquency activities: shoplifting, sneaking out at night, joyriding, and wrecking other people's property. Participants responding *never* for *each* of the four activities were categorized as no risk (no involvement). High-risk involvement was defined as involvement with *any* of the four activities more than once in the past year. All other respondents, (i.e., those involved with at least one activity once in the past year), were classified as at-risk (some involvement).

Major Delinquency

Participants were classified into three levels of risk based on their involvement in major delinquency: no risk (no involvement), at-risk (some involvement), and high risk (high involvement). Three items were used as indicators of involvement in major delinquency activities: joining a gang, carrying a gun as a

weapon, and carrying a knife as a weapon. Participants indicating no involvement with *all* three activities were categorized as no risk (no involvement). High-risk involvement was defined as involvement with *any* of the three activities at least once in the past year (Barone et al., 1995; Hayne, 2002; Winters et al., 2002). No intermediate at-risk (some involvement) category was defined for major delinquency activities due to any involvement in these activities can be considered "high-risk."

Direct Aggression

Participants were classified into three levels of risk based on their involvement in acts of direct aggression: no risk (no involvement), at-risk, and high risk. Involvement was assessed by four items: pushed and shoved someone, swore at someone and called then names, teased and ridiculed someone, and kicked and hit someone in the past school year (adapted from Marini et al., 1999). Participants who indicated *never* to all items were classified as no risk (no involvement). Those who indicated involvement with at least one of the four behaviours *a few times a month* or more frequently were classified as high-risk involvement (Kaltiala-Heino et al., 2000; Natvig et al., 2001). All other respondents, (i.e., those indicating involvement with at least one direct aggressive behaviour no more than a few times a year), were classified as at-risk (some involvement).

Indirect Aggression

Participants were classified into three levels of risk based on participant's involvement in acts of indirect aggression: no risk (no involvement), at-risk (some involvement), and high risk (high involvement). Involvement was assessed by four items: writing harmful and unsigned notes, excluding someone from joining an

activity, spreading rumors and untrue stories, daring another student to hurt someone (Marini et al., 1999) using the same scale as for direct aggression. Participants indicating *never* to all items were classified as no risk (no involvement). Those who indicated involvement with at least one of the four behaviours *a few times a mon*th or more frequently were classified as high-risk involvement (Kaltiala-Heino et al., 2000; Natvig et al., 2001). All other respondents, (i.e., those indicating involvement with at least one indirect aggressive behaviour no more than a few times a year), were classified as at-risk (some involvement).

Procedure

Approval by Brock University's Research Ethics Board was obtained for this study (See Appendix D).

School Selection

Two school boards participated in this study. Approval was granted by each school board prior to contacting individual schools. In one school board, participation in the study by all secondary schools (N=22) was made mandatory by the school board. In the second school board, individual school participation was voluntary resulting in 37.5% of possible schools agreeing to participate. In sum, 25 of 30 schools (83%) of secondary schools encompassing a school district in a southern Ontario region in Canada participated in this study.

Promotion of the Study

School

To ensure that youth, teachers, and school administrators were fully aware of this study, four student assemblies, 37 teacher information sessions, five school

council presentations, and six school administrator presentations were delivered. When deemed appropriate by the school, an announcement was made prior to the data collection outlining the importance of the survey (see Appendix E for a sample announcement.

Parent

To ensure that parents were aware of the study and had an opportunity to address any questions about the study, 18 parent information sessions, 12 media interviews, and nine newspaper articles were written about the study.

Consent Procedures

Parental Consent

Letters were mailed to parents of eligible students explaining the study, inviting them to attend a parent information session to learn more about the study, and asking parents to return the consent form to their child's school only if they did not wish their child to participate (See Appendix F). Research assistants picked up the non-consent forms prior to survey implementation and prepared a class list identifying students who did not have parental consent to participate in the study.

Student Consent

On the day of survey implementation, research assistants or teachers spent approximately fifteen minutes explaining the importance of the survey, what the survey was about, that participation was voluntary, and that no answer was incorrect (see Appendix G). When student questions about the study had been addressed, written approval for student participation was obtained (See Appendix H).

Any students who were not participating in the study because they did not have parental permission or who themselves chose not to participate were given alternative materials to be completed while the other students were completing the study. The alternative materials consisted of small exercises, such as crossword puzzles, word and picture matching, and 'what if' scenarios, dealing with stress management, conflict, and nutrition.

Participation Rate

The overall participation rate was 76% of students enrolled in participating schools ($N = 7,430$). Non-participation was due to student absenteeism (17%), student refusal (4%), and parental refusal (3%).

Survey Administration

Students with parental and self consent were given the questionnaire package by either research assistants or teachers and were instructed to remove the consent form prior to removing the questionnaire from their envelope. The completed consent form was collected by research assistants, placed in a sealed envelope and returned to the YLC-CURA research project office. Students then were asked to complete the 23-page self-report questionnaire. If the students had literacy difficulties, the survey was read aloud by a research assistant, school nurse, or teacher to ensure that everyone could participate regardless of literacy level. The survey was completed either in one two-hour session (12 schools), two one-hour sessions (10 schools), three 45-minute sessions (two schools), or five 30-minute sessions (one school). The selection of the administration procedure was the decision of the school principal. When multiple sessions were administered, participants were given envelopes in

which to seal and secure their survey between sessions. Participants put their names on the front of the sealed envelope and the envelopes were collected by research assistants and stored in the vault at the school, organized by classroom. Each student's envelope was distributed by research assistants at the start of the next session. For the final administration, participants placed their completed survey in an unsigned envelope and sealed it.

Confidentiality

Students were assured that their responses were confidential and would not be shared with parents, teachers, principals, or other students. It was explained that only researchers would see their responses and no researcher would have access to their name. Only one person had access to the names and that person did not have access to the questionnaires. Students were informed that, as required by law, the only time that confidentiality would be broken would be in the case of reported abuse and in such cases, no other survey information would be shared.

Researchers have demonstrated that when students are assured of confidentiality, self-report measures of risk behaviours have good validity (e.g., Murray & Perry, 1987; White, 1991). Further, researchers examining aggression indicate that self-reports yield similar results to peer reports (Crick & Bigbee, 1998).

Debriefing

At the completion of the survey, students were handed a "Contact Me Sheet" (See Appendix I) on which they could identify themselves and ask to meet with an adult (e.g., school nurse, guidance counselor, teacher, minister/priest, parent, etc.) to discuss the content of the survey. The purpose of this sheet was to ensure that

students had an opportunity, if needed, to discuss the content of the survey. If a student completed the "Contact Me" sheet, the YLC-CURA first contacted that student via written correspondence, confirming their intention and asking them to contact the YLC-CURA office for additional information. The YLC-CURA would then obtain the name of the person the student would like to speak with and facilitated the meeting between the student and that person. In addition, all students were left with a bookmark identifying phone numbers of key youth-serving agencies students could contact if they became distressed following the survey. Phone numbers included on the bookmark were the Kids Help Phone Line, the local youth drug and alcohol assessment service, the local distress centre, and the local crisis service hotline. Finally, students were left with an information sheet about the YLC-CURA and the research project.

Research assistants returned all surveys to the YLC-CURA research office following the completion of the data collection.

Data Preparation

Data Cleaning

To prepare the data, several steps were taken to ensure its quality. First, a manual examination of each survey was conducted for identification of surveys which clearly had not been completed with seriousness. Two hundred surveys were removed prior to survey scanning.

When the surveys had been scanned, scales were examined for lack of variability in responses. Given that each of the scales included reverse-coded items, variability in responses was expected. Any survey that had no variability in three or

more of the seven scales containing positively-worded and negatively-worded items were removed from the analysis. Those that responded *sometimes* consistently within scales were not removed as this consistent response was plausible. A total of 140 additional surveys (2%) were removed from analysis due to acquiescent rating styles. Of the 7,290 remaining participants, those who completed less than 50% of the gambling questions were removed (48%, n=3,523), given that over 50% of the data would have to be imputed for these individuals.

Missing Data

Composite (average) scores were computed for participants who responded to at least 50% of the items within a scale. For students who did not give a sufficient number of responses within a scale, composite scores were imputed. On average, a total of 3.1% of the data was missing (range of missing data 0.0% to 16.7% (see Table 1). The amount of missing data was directly related to survey length, (i.e., missing values were greatest toward the end of the survey). Thus, fatigue, boredom, or insufficient time to complete the survey may have played a role.

Missing data were imputed using the EM (expectation-maximization) algorithm in SPSS. EM is an iterative maximum-likelihood procedure in which a cycle of calculating means and covariances followed by data imputation is repeated until a stable set of estimated missing values is reached. Methodological research has demonstrated that maximum likelihood estimation of missing data is preferable to more common methods such as pair-wise deletion, list-wise deletion, or means substitution (for recent reviews see Allison, 2002; Enders, 2001; Schafer & Graham, 2002).

Table 1. *Percentage of Missing Data on Composite Scores*

Domain	Variables	%	*n*
Demographics	Age	0.6	22
	Gender	3.1	117
Neighbourhood	Neighbourhood quality	1.0	39
	Substance available	8.9	337
	Clubs – community	2.6	99
	Sports - community	2.1	78
	Church attendance	2.2	84
School	School culture	3.0	113
	Substance available	5.7	214
	Clubs – school	2.3	86
	Sports – school	1.8	68
	Skipping classes	1.0	37
	Grades	6.0	226
	School goals	2.6	99
	Planfulness	1.0	37
	Do well – self	0.9	33
	Do well – friends	1.1	42
	Do well – parents	1.6	60
	Bored at school	2.1	78
Family	Background	0.4	16
	Mother's education	6.2	232
	Father's education	5.7	214
	Curfew – week	2.2	83
	Curfew - weekend	2.9	110
	Talk with parents	1.4	52
	Fun with parents	1.9	71
	Parents know	2.1	80
	Attachment – dad	6.7	252
	Attachment - mom	3.9	148
	Parents ask	2.3	87
	Sibling risk behaviour	8.5	322
	Parents upset	3.8	144
Intrapersonal	Adaptability	1.2	43
	Activity	1.2	47
	Rhythmicity	1.1	41
	Flexibility	0.4	14
	Mood	0.9	33
	Distractibility	1.3	49
	Persistence	1.2	46
	Life satisfaction	1.7	64
	Religiosity	1.4	54
	Social anxiety	8.4	316
	Self-esteem	2.2	84
	Depression	8.0	302
	Daily hassles	2.8	104
	Risky for you	4.4	164
	Risky for others	5.7	213
	Tolerance of Dev	3.8	143
Peers	Dating	2.2	81
	Hung out with friends	1.2	47
	Partying	1.8	69
	Best friend	16.7	628
	Friendship quality	5.1	191
	Victimization - direct	0.9	35
	Victimization - indirect	1.0	37
	Friends upset	8.8	33
Risk	Smoking	1.9	71
Behaviours	Alcohol frequency	2.4	90
	Alcohol amount	4.7	176
	Marijuana	4.4	167
	Hard drugs	3.3	124
	Sexual activity	7.9	299
	Direct aggression	2.1	78
	Indirect aggression	1.9	71
	Major delinquency	3.0	113
	Minor delinquency	2.7	102
	Gambling frequency	0.0	0
	Gambling consequences	0.0	0

Note: *N*'s = 3,767 (all respondents)

RESULTS

Sensitivity Checking

To determine where there were differences between those who completed the gambling questions and those who did not complete the gambling questions, sensitivity checking was conducted between the sample of adolescents ($N = 3,767$) who had less than 50% missing on both the gambling measures (i.e., gambling activities and gambling consequences) and the sample of adolescents who had more than 50% missing data on either of the gambling behaviour measures ($N = 3,253$). Mean comparisons using One-way ANOVAs were based on demographics (age and gender) and variables/behaviours that appeared before the mid-part of the survey (i.e., school grades, attachment to mother, attachment to father, depression, marijuana use, smoking, alcohol use, hard drugs, minor and major delinquency, and direct and indirect aggression). Due to the large sample size, many comparisons based on group averages were statistically significant. However, the greatest mean difference between groups was 0.21 for marijuana use and for smoking (see Table 2). In general, the excluded group was slightly younger, comprised of a slightly greater percentage of males, reported lower average grades, more symptoms of depression, more frequent smoking, as well as less frequent marijuana use, hard drug use, indirect aggression, minor delinquency, and major delinquency.

To examine the extent to which these variables represented meaningful differences between the two samples, a discriminant function analysis was conducted to determine the extent to which the two samples could be differentiated based on demographics, inter/intrapersonal, and problem behaviours. Together, the

Table 2.

Results of One-Way ANOVA for Differences Between Complete and Incomplete Data

Variable	*F*	*p*	Complete Data		Incomplete Data	
			M	*SD*	*M*	*SD*
Age	13.66	.000	15.77	1.40	15.65	1.36
School Grades	131.54	.000	2.73	0.99	3.00	1.01
Attachment to Mother	0.50	.478	1.96	0.59	1.97	0.54
Attachment to Father	4.42	.036	2.10	0.62	2.07	0.57
Depression	4.00	.046	2.00	0.70	2.03	0.50
Alcohol Use	0.27	.603	2.59	1.73	2.61	1.76
Smoking	26.86	.000	1.03	1.68	1.24	1.82
Marijuana Use	32.25	.000	2.08	1.57	2.29	1.65
Hard Drug Use	17.71	.000	1.18	0.59	1.24	0.65
Direct Aggression	6.53	.011	1.73	0.83	1.78	0.84
Indirect Aggression	13.28	.000	1.21	0.46	1.25	0.49
Minor Delinquency	25.92	.000	1.40	0.55	1.46	0.53
Major Delinquency	27.44	.000	1.09	0.33	1.13	0.33

Note. Complete data: included participants (*N*=3,767) who completed 50% or more of the gambling activity questions and the gambling consequences questions. Incomplete data: included participants (*N*=3,253) who completed less than 50% of the gambling activity questions and the gambling consequences questions.

demographic, intra/interpersonal, and problem behavior variables explained only 2.6% of the separation between groups, Wilkes $\Lambda = .974$, $\chi^2 = 174.59$, $df = 14$, $p < .001$. These results suggest that, when compared to participants excluded from the sample due to missing data, the sample of respondents in this study was not meaningfully different in terms of demographics, inter/intrapersonal variables, or eight types of problem behaviors.

Prevalence of Adolescent Gambling Behaviour and Gambling Consequences

Correlations Among Gambling Activities and Gambling Consequences

Correlations among the eight gambling activities ranged from a low of .224 to a high of .666 (see Table 3). All correlations were significant at $p < .001$. The most highly correlated items were among the activities that the participants reported engaging in the least amount of time (e.g., bingo, horse races, and casino). Correlations among the six gambling consequences were moderate to high ranging from .369 to .637 (see Table 4). All correlations were significant at $p < .001$.

Prevalence of Overall Gambling Activities and Gambling Consequences

Differences in the overall prevalence of gambling activities and gambling consequences by age and gender were assessed using the One-Way ANOVA procedure. Given the exploratory nature of this study and the power in this study, a conservative indicator of significant effects (at $p \leq .001$) was selected for all analyses. For significant age effects, Tukey pairwise comparisons were used to test for mean differences between age groups. In keeping with the conservative approach taken in this study, Tukey HSD test was selected because it is a conservative post hoc

Table 3.

Correlations Among Individual Gambling Activities

Gambling Activity	1	2	3	4	5	6	7	8
1. Playing cards	--							
2. Playing pokemon	.327	--						
3. Buying lottery tickets	.276	.310	--					
4. Betting on sports	.365	.313	.464	--				
5. Entering draws	.260	.347	.468	.455	--			
6. Going to bingo	.260	.478	.350	.368	.469	--		
7. Betting on horse races	.274	.419	.361	.435	.459	.648	--	
8. Going to casino	.224	.390	.320	.332	.365	.561	.666	--

Note. All correlations were significant at $p < .001$.

Table 4.

Correlations Among Individual Gambling Consequences

Gambling Consequences	1	2	3	4	5	6
1. Spend more	--					
2. Win back	.567	--				
3. Not stop	.538	.511	--			
4. Arguments	.448	.494	.672	--		
5. Borrowed money	.369	.384	.534	.491	--	
6. Unhappy	.494	.476	.637	.603	.503	--

Note. All correlations are significant at $p < .001$.

comparison procedure and it controls the alpha level while testing all possible differences (Howell, 2002).

Gambling Activities

The prevalence of gambling involvement was examined using a composite measure computed by averaging involvement across the eight gambling activities. Overall, adolescents reported gambling infrequently with a mean frequency between "never" and "once or twice a month." Almost 58% of adolescents, however, reported gambling within the last month. Means and standard deviations for each gambling activity by gender and age are found in Tables 5 and 6. As average frequencies were low and distributions were positively skewed, a $\log_{10}$ transformation was applied prior to analysis[1].

To examine age and gender effects, a 2 x 5 ANOVA was conducted with overall gambling participation as the dependent variable, and gender and age (14, 15, 16, 17, and 18) as the independent variables. Consistent with past research (Govoni, Rupcich & Frisch, 1996; Gupta & Derevensky, 1998b, 2001; Ladouceur, Dube & Bujold, 1994), there was a significant main effect for gender, $F(1, 3757) = 219.49$, $p < .001$, with males reporting gambling more frequently than females. The main effect for age and the interaction between age and gender were not significant, $F(4, 3757) = 1.32$, $p = .262$ and $F(4, 3757) = 3.74$, $p = .005$ respectively.

Gambling Consequences

A composite measure of gambling consequences was computed by averaging the frequency of experiencing the six gambling consequences (see Tables 5 and 7 for means and standard deviations by age and gender). A $\log_{10}$ transformation was

[1] The pattern of findings did not change when using transformed scores versus raw scores.

Table 5.

Means and Standard Deviations of Gambling Activities and Consequences For Overall Sample and by Gender

Variable	Overall		Male		Female	
	M	*SD*	*M*	*SD*	*M*	*SD*
Activities						
Composite gambling activity	1.22	0.38	1.31	0.49	1.14	0.22
Playing cards	1.45	0.84	1.65	0.98	1.28	0.66
Playing pokemon	1.11	0.50	1.18	0.64	1.06	0.32
Buying lottery tickets	1.34	0.67	1.42	0.76	1.28	0.57
Betting on sports	1.27	0.69	1.46	0.88	1.10	0.39
Entering draws	1.31	0.61	1.39	0.73	1.25	0.49
Going to bingos	1.08	0.39	1.12	0.50	1.04	0.24
Betting on horse races	1.07	0.40	1.13	0.54	1.03	0.21
Going to casinos	1.08	0.42	1.13	0.55	1.04	0.25
Consequences						
Composite gambling consequences	1.10	0.29	1.16	0.38	1.05	0.16
Spending more than wanted to	1.13	0.42	1.20	0.52	1.08	0.30
Trying to win back losses	1.18	0.48	1.28	0.61	1.09	0.32
Not being able to stop gambling	1.06	0.34	1.12	0.46	1.02	0.17
Arguing with others over gambling	1.06	0.31	1.10	0.42	1.02	0.15
Borrowing money to gamble	1.11	0.40	1.15	0.48	1.08	0.33
Feeling unhappy about gambling	1.06	0.31	1.11	0.42	1.02	0.15

Note. N=3,767, male: n = 1,722, female: n = 2,045, 1= never, 5 = everyday. Non-transformed data are reported.

Table 6.

Means and Standard Deviations (in parentheses) of Gambling Activities by Age

	Age				
Variables	14	15	16	17	18
Composite gambling activity	1.22 (0.43)	1.23 (0.41)	1.20 (0.36)	1.20 (0.36)	1.22 (0.31)
Playing cards	1.46 (0.87)	1.51 (0.80)	1.45 (0.82)	1.47 (0.84)	1.36 (0.78)
Playing pokemon	1.16 (0.62)	1.14 (0.53)	1.08 (0.39)	1.10 (0.47)	1.08 (0.38)
Buying lottery tickets	1.27 (0.64)	1.26 (0.61)	1.34 (0.68)	1.33 (0.60)	1.60 (0.76)
Betting on sports	1.28 (0.73)	1.35 (0.78)	1.26 (0.67)	1.22 (0.61)	1.21 (0.58)
Entering draws	1.37 (0.68)	1.34 (0.65)	1.28 (0.57)	1.29 (0.56)	1.27 (0.53)
Going to bingos	1.07 (0.40)	1.07 (0.36)	1.07 (0.37)	1.08 (0.41)	1.10 (0.38)
Betting on horse races	1.09 (0.46)	1.07 (0.39)	1.08 (0.39)	1.07 (0.42)	1.04 (0.27)
Going to casinos	1.08 (0.46)	1.08 (0.36)	1.06 (0.36)	1.07 (0.40)	1.13 (0.38)

Note. $N = 3{,}767$, 14: $n = 995$; 15: $n = 672$; 16: $n = 899$; 17: $n = 611$; 18: $n = 590$. Non-transformed scores are reported.

Table 7.

Means and Standard Deviations (in parentheses) of Gambling Consequences by Age

Variable	Age				
	14	15	16	17	18
Composite gambling consequences	1.10 (0.31)	1.09 (0.30)	1.12 (0.31)	1.10 (0.28)	1.09 (0.22)
Spending more than wanted to	1.11 (0.41)	1.08 (0.34)	1.15 (0.45)	1.15 (0.44)	1.17 (0.45)
Trying to win back losses	1.17 (0.49)	1.15 (0.44)	1.21 (0.52)	1.18 (0.47)	1.17 (0.45)
Not being able to stop	1.07 (0.35)	1.07 (0.38)	1.08 (0.35)	1.06 (0.31)	1.04 (0.25)
Arguing with others	1.07 (0.35)	1.06 (0.32)	1.06 (0.30)	1.06 (0.30)	1.03 (0.24)
Borrowing money to gamble	1.12 (0.44)	1.13 (0.46)	1.12 (0.40)	1.11 (0.41)	1.05 (0.25)
Feeling unhappy	1.05 (0.29)	1.05 (0.32)	1.08 (0.34)	1.05 (0.28)	1.06 (0.29)

Note. $N = 3{,}767$, 14: $n = 995$; 15: $n = 672$; 16: $n = 899$; 17: $n = 611$; 18: $n = 590$. Non-transformed scores are reported.

applied prior to analysis. Overall, a total of 851 participants (22.6% of the sample) reported experiencing at least one consequence within the past year, with a mean close to never. Age and gender effects were examined through a 2 x 5 ANOVA with overall gambling consequences as the dependent variable and gender and age (14, 15, 16, 17, and 18) as the between-subjects variables. Consistent with past research (Gupta & Derevensky, 1998b), there was a significant main effect for gender, $F(1, 3757) = 143.91, p < .001$, with males reporting experiencing consequences more frequently than females. The main effect for age and the interaction between age and gender were not significant, $F(4, 3757) = 1.39, p = .235$ and $F(4, 3757) = 2.31, p = .055$ respectively.

Prevalence of Individual Gambling Activities and Gambling Consequences

Also of interest was the examination of individual gambling activities and individual gambling consequences rather than just the examination of the composite measures. Therefore, individual gambling activities and individual gambling consequences were examined for age and gender differences using the MANOVA procedure. The MANOVA procedure takes into consideration the correlations among the gambling activities while allowing for the examination of mean differences on all dependent measures (Bray & Maxwell, 1985). In addition, the omnibus MANOVA analysis controls for potential Type I error (Bray & Maxwell, 1985; Tabchnick & Fidell, 2001).

Given the exploratory nature of this study and the power in this study, a conservative indicator of significant effects (at $p \leq .001$) was selected for all analyses.

Significant effects were followed up using one-way ANOVAs and Tukey pairwise comparisons if appropriate.

The assumption of multivariate normal distribution of dependent variables, required with the MANOVA procedure, was not met as four variables were positively skewed (largest skewness 6.8 and kurtosis 52.9 for betting on horse races). To reduce the potential loss in statistical power (Bray & Maxwell, 1985), the dependent measures were transformed using a log10 transformation procedure. The non-normality of the individual variables was reduced to a maximum skewness of 5.3 and kurtosis of 29.5 for betting on horse races. In addition, the assumption of common within group covariances was not met. The impact of this assumption violation also is a potential reduction in statistical power. Given the statistical power offered by the sample size, however, the violations were not of sufficient concern to consider other statistical options.

Prevalence of Individual Gambling Activities

The most commonly reported gambling activity was playing cards for money (28.8% of the sample) followed by buying lottery tickets (25.9%) and entering draws (25.7%). The least frequently reported activity was going to the horse races (4.5%). The ranking of activities was fairly consistent across gender and age (see Table 8 for summary of the rankings).

To explore age and gender effects, an 8 x 2 x 5 MANOVA was conducted with the gambling activities (playing cards for money, playing pokemon for keeps, buying lottery tickets, betting on sports, entering draws, going to bingo, betting on horse races, going to the casino) as the dependent variables and gender and age (14,

Table 8.

Summary of Ranking of Gambling Activity Preference by Gender and Age

Gambling Activity	Overall	Male	Female	14	15	16	17	18
Playing cards	1	1	3	2	1	1	1	2
Buying lottery tickets	2	2	1/2	3	3/4	2	2	1
Entering draws	3	3	1/2	1	2	3	3	3
Betting on sports	4	4	4	4	3/4	4	4	4
Playing pokemon	5	5	5	5	5	6	5	6
Going to bingos	6	6	6	7	6	7	6	5
Going to casinos	7	7	7	8	8	8	7	5
Betting on horse races	8	8	8	6	7	5	8	7

15, 16, 17, and 18) as the independent variables. Using Wilks' criterion at $p \leq .001$, main effects were found for gender, $F(8, 3750) = 48.53, p < .001$ and age, $F(32, 13831) = 12.72, p < .001$. The two-way interaction, age by gender, was not significant, $F(32, 13831) = 1.56, p = .023$. For the gender main effect, males reported gambling significantly more than females on all activities, smallest $F(1, 3757) = 31.30, p < .001$ for going to bingo. For the age main effect, buying lottery tickets, going to the casino, and entering draws were significant, smallest $F(4, 3757) = 4.46, p = .001$ for entering draws. Follow-up Tukey's analyses revealed that for buying lottery tickets and going to the casino, 18 year olds reported significantly more purchasing of lottery tickets and going to the casino than adolescents aged 17 and younger. There were no other significant age differences. For entering draws, 14 year olds reported entering draws significantly more often than adolescents aged 16 or 18. There were no other significant age differences.

Prevalence of Individual Gambling Consequences

The most commonly reported gambling consequences were trying to win back lost money (14.4%), spending more money than they wanted to (10.8%), and borrowing money to gamble and not paying it back (8.6%). The least frequently reported consequences were having arguments with family and friends because of gambling and feeling unhappy about their gambling behaviour (each 4.2%). The ranking of consequences was fairly consistent across gender and age. See Table 9 for a summary of the rankings of gambling consequences by gender and age.

A 6 x 2 x 5 MANOVA was conducted with consequences (spent more than they wanted to, tried to win back lost money, tried and could not stop gambling, had

Table 9.

Summary of Ranking of Gambling Consequences by Gender and Age

Gambling Consequence	Overall	Male	Female	14	15	16	17	18
Trying to win back losses	1	1	1	1	1	1	1	2
Spending more than wanted to	2	2	2	2/3	3	2	2	1
Borrowing money	3	3	3	2/3	2	3	3	3
Not being able to stop	4	4	5	5	4	4	5	5
Arguing with others	5/6	6	4	4	5	6	4	6
Feeling unhappy	5/6	5	6	6	6	5	6	4

arguments with friends/family because of gambling, borrowed money to gamble and did not pay it back, felt unhappy about gambling behaviour) as the dependent variables and gender and age (14, 15, 16, 17, 18) as the independent variables. Using Wilks' criterion, main effects were found for gender, $F(6, 3752) = 28.54, p < .001$, and age, $F(24, 13090) = 3.18, p < .001$. The two-way interaction between age and gender was not significant, $F(24, 13090) = 1.71, p = .017$. For the gender main effect, all six consequences were significant, with males experiencing each consequence more frequently than females, smallest $F(1, 3757) = 27.16, p < .001$ for borrowed money to gamble and did not pay it back. For the age main effect, only spending more than they wanted to was significant, $F(4, 3757) = 6.63, p < .001$. Follow-up Tukey's analyses revealed that students aged 18 reported experiencing the consequence of spending more than they wanted to more frequently than students aged 14 or 15, and students aged 16 and 17 reported experiencing the consequence more frequently than those students aged 15. There were no other significant age differences.

Predictors of Gambling Involvement

To determine the predictors of gambling involvement, a comprehensive set of 56 variables from the domains of neighbourhood, school, family, intrapersonal, and peers (see Tables 10 and 11 for means and standard deviations of the variables by age and gender) was conceptually reduced to 19 constructs. For example, all temperament measures were grouped together and all variables addressing aspects of parental relationships (i.e., attachment to mother, attachment to father, having fun with parents) were grouped together. The temperament subscale, flexibility, was removed

Table 10.

Means and Standard Deviations for Predictor Variables by Gender

		All		Males		Females	
Domain	Variables	Mean	SD	Mean	SD	Mean	SD
Demographics	Age	15y8m	16m	15y7m	16m	15y8m	16m
	Gender % male	45.7%					
Neighbourhood	Neighbourhood quality	2.15	0.69	2.13	0.69	2.17	0.68
	Substance available	2.32	1.04	2.35	1.05	2.29	1.03
	Clubs – community	4.19	1.14	4.19	1.14	4.19	1.13
	Sports - community	3.90	1.39	3.66	1.43	4.11	1.31
	Church attendance	4.29	0.98	4.37	0.95	4.22	1.01
School	School culture	2.63	0.52	2.64	0.53	2.62	0.50
	Substance available	2.75	0.88	2.77	0.88	2.73	0.88
	Clubs – school	4.22	1.20	4.34	1.14	4.11	1.24
	Sports – school	3.93	1.44	3.84	1.47	4.01	1.41
	Skipping classes	4.18	1.11	4.20	1.10	4.18	1.11
	Grades	2.73	0.99	2.92	1.01	2.58	0.94
	School goals	4.46	1.45	4.32	1.45	4.58	1.45
	Planfulness	2.59	0.89	2.71	0.87	2.50	0.89
	Do well – self	1.66	0.83	1.79	0.90	1.55	0.75
	Do well – friends	3.04	1.19	3.23	1.23	2.89	1.12
	Do well – parents	1.48	0.73	1.48	0.76	1.47	0.71
	Bored at school	2.20	0.85	2.08	0.85	2.31	0.84
Family	Background	1.01	0.08	1.00	0.05	1.01	0.10
	Mother's education	3.07	1.45	3.12	1.44	3.03	1.46
	Father's education	3.14	1.53	3.18	1.55	3.10	1.51
	Curfew – week	4.19	1.91	4.45	2.01	3.97	1.79
	Curfew - weekend	6.56	1.95	6.84	1.95	6.33	1.91
	Talk with parents	2.17	1.02	2.33	1.01	2.04	1.01
	Fun with parents	2.99	0.84	2.98	0.84	3.01	0.84
	Parents know	2.17	0.72	2.28	0.71	2.08	0.71
	Attachment – dad	2.10	0.62	2.08	0.57	2.12	0.67
	Attachment - mom	1.96	0.59	2.00	0.52	1.92	0.65
	Parents ask	2.16	0.58	2.21	0.62	2.13	0.54
	Sibling risk behaviour	1.49	0.69	1.49	0.71	1.50	0.67
	Parents upset	1.68	0.62	1.81	0.66	1.57	0.56
Intrapersonal	Adaptability	2.04	0.54	2.05	0.54	2.03	0.54
	Activity	2.67	0.81	2.67	0.79	2.66	0.83
	Rhythmicity	2.53	0.64	2.49	0.63	2.57	0.64
	Flexibility	2.05	0.59	2.06	0.60	2.04	0.58
	Mood	1.66	0.64	1.81	0.66	1.53	0.60
	Distractibility	2.64	0.53	2.61	0.55	2.66	0.52
	Persistence	2.36	0.62	2.31	0.61	2.41	0.63
	Life satisfaction	1.80	0.83	1.73	0.82	1.86	0.84
	Spirituality	1.97	0.79	2.08	0.79	1.88	0.77
	Social anxiety	1.73	0.59	1.75	0.61	1.71	0.58
	Self-esteem	2.26	0.74	2.17	0.72	2.34	0.74
	Depression	2.00	0.70	1.92	0.68	2.07	0.70
	Daily hassles	1.78	0.35	1.70	0.34	1.86	0.33
	Risky for you	2.91	1.01	3.03	1.02	2.82	0.99
	Risky for others	2.77	0.99	2.90	1.03	2.66	0.94
	Tolerance of Dev	1.94	0.56	2.06	0.61	1.85	0.50
Peers	Dating	3.64	1.35	3.74	1.30	3.56	1.38
	Hung out with friends	2.18	0.99	2.16	1.03	2.20	0.96
	Partying	3.73	0.97	3.68	1.04	3.78	0.90
	Best friend	1.81	0.48	2.05	0.46	1.61	0.41
	Friendship quality	1.81	0.52	1.99	0.48	1.66	0.50
	Victimization - direct	1.82	0.85	2.07	0.95	1.61	0.69
	Victimization - indirect	1.31	0.51	1.34	0.58	1.29	0.44
	Friends upset	2.75	0.89	3.05	0.82	2.49	0.87

Note: *N*'s = 3,767 all respondents, 1,722 males, 2,045 females.

Table 11.

Means and Standard Deviations for Predictor Variables by Age

		14		15		16		17		18	
Domain	Variables	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Demographic	Gender % male	46.0%		46.3%		47.4%		46.8%		40.8%	
Neighbourhood	N'hood quality	2.08	0.70	2.09	0.64	2.19	0.68	2.23	0.69	2.19	0.68
	Substance available	2.15	1.03	2.17	1.01	2.42	1.06	2.43	1.03	2.52	1.02
	Clubs – community	4.20	1.14	4.14	1.14	4.18	1.15	4.21	1.16	4.23	1.10
	Sports - community	3.72	1.45	3.66	1.46	3.95	1.35	4.18	1.26	4.13	1.30
	Church attendance	4.26	0.98	4.22	1.00	4.31	0.99	4.32	0.98	4.37	0.94
School	School culture	2.60	0.53	2.64	0.53	2.67	0.52	2.65	0.53	2.59	0.46
	Substance available	2.63	0.89	2.58	0.89	2.82	0.87	2.86	0.86	2.92	0.81
	Clubs – school	4.38	1.07	4.32	1.12	4.22	1.19	4.20	1.24	3.82	1.39
	Sports – school	3.85	1.44	3.81	1.47	3.99	1.41	4.06	1.42	4.00	1.44
	Skipping classes	4.47	0.93	4.41	0.97	4.12	1.12	4.02	1.18	3.71	1.22
	Grades	2.70	0.97	2.84	1.03	2.79	1.00	2.77	0.97	2.54	0.95
	School goals	4.34	1.58	4.39	1.53	4.44	1.41	4.41	1.39	4383	1.21
	Planfulness	2.71	0.87	2.64	0.87	2.61	0.89	2.56	0.88	2.35	0.88
	Do well – self	1.63	0.85	1.71	0.86	1.65	0.81	1.73	0.83	1.59	0.79
	Do well – friends	2.99	1.18	3.10	1.19	3.08	1.21	3.06	1.19	2.99	1.17
	Do well – parents	1.43	0.73	1.47	0.74	1.49	0.77	1.51	0.70	1.52	0.71
	Bored at school	2.18	0.87	2.15	0.83	2.14	0.85	2.21	0.84	2.40	0.83
Family	Background	1.00	0.05	1.00	0.05	1.01	0.07	1.01	0.12	1.01	0.10
	Mother's education	2.99	1.45	3.14	1.50	3.01	1.39	3.05	1.41	3.24	1.51
	Father's education	3.04	1.53	3.07	1.52	3.10	1.49	3.18	1.53	3.38	1.57
	Curfew – week	3.39	1.50	3.70	1.63	4.21	1.71	4.56	1.83	5.66	2.21
	Curfew - weekend	5.57	1.92	6.00	1.95	6.81	1.74	7.06	1.68	7.99	1.29
	Talk with parents	2.19	1.01	2.25	1.03	2.20	1.03	2.17	1.01	2.02	1.01
	Fun with parents	2.82	0.86	2.90	0.85	3.05	0.82	3.14	0.81	3.17	0.79
	Parents know	2.08	0.72	2.17	0.72	2.23	0.72	2.21	0.70	2.21	0.70
	Attachment – dad	2.06	0.62	2.07	0.62	2.13	0.62	2.14	0.63	2.11	0.63
	Attachment - mom	1.95	0.60	1.97	0.60	1.97	0.58	2.00	0.61	1.88	0.56
	Parents ask	2.26	0.61	2.25	0.62	2.11	0.53	2.13	0.57	2.04	0.51
	Sibling risk behaviour	1.45	0.70	1.50	0.70	1.55	0.69	1.57	0.67	1.59	0.63
	Parents upset	1.51	0.58	1.60	0.63	1.72	0.60	1.80	0.64	1.87	0.60
Intrapersonal	Adaptability	2.02	0.53	2.08	0.54	2.07	0.55	2.02	0.54	1.99	0.56
	Activity	2.67	0.84	2.63	0.81	2.65	0.80	2.62	0.81	2.76	0.79
	Rhythmicity	2.51	0.65	2.53	0.62	2.55	0.65	2.55	0.63	2.53	0.63
	Flexibility	2.03	0.59	2.05	0.58	2.07	0.59	2.06	0.59	2.04	0.57
	Mood	1.62	0.63	1.70	0.68	1.68	0.63	1.68	0.65	1.64	0.63
	Distractibility	2.67	0.55	2.68	0.55	2.62	0.51	2.63	0.52	2.58	0.52
	Persistence	2.41	0.62	2.40	0.61	2.34	0.62	2.34	0.60	2.28	0.64
	Life satisfaction	1.74	0.83	1.82	0.83	1.85	0.86	1.84	0.82	1.81	0.81
	Spirituality	1.93	0.77	1.96	0.79	1.96	0.78	2.03	0.80	2.02	0.83
	Social anxiety	1.79	0.63	1.77	0.60	1.77	0.60	1.68	0.54	1.66	0.53
	Self-esteem	2.29	0.77	2.27	0.75	2.26	0.73	2.27	0.73	2.18	0.69
	Depression	1.99	0.71	2.02	0.74	2.00	0.66	2.02	0.70	1.97	0.67
	Daily hassles	1.79	0.37	1.80	0.35	1.78	0.35	1.78	0.34	1.76	0.32
	Risky for you	2.84	1.10	2.86	1.04	2.98	1.00	2.92	0.94	2.99	0.89
	Risky for others	2.63	1.05	2.69	1.00	2.88	1.02	2.81	0.92	2.88	0.86
	Tolerance of Dev	1.93	0.60	1.97	0.58	1.98	0.56	1.95	0.55	1.88	0.49
Peers	Dating	4.02	1.17	3.86	1.25	3.47	1.38	3.42	1.40	3.24	1.43
	Hung out with friends	2.25	1.04	2.22	1.03	2.16	1.00	2.13	0.94	2.11	0.90
	Partying	3.87	0.94	3.78	0.97	3.69	1.00	3.62	1.00	3.63	0.90
	Best friend	1.83	0.49	1.84	0.48	1.85	0.49	1.76	0.47	1.72	0.45
	Friendship quality	1.83	0.52	1.85	0.52	1.85	0.53	1.78	0.52	1.73	0.50
	Victimization - direct	1.94	0.91	1.87	0.85	1.83	0.83	1.75	0.83	1.60	0.72
	Victimization – indir.	1.35	0.55	1.34	0.53	1.31	0.52	1.30	0.50	1.24	0.38
	Friends upset	2.62	0.95	2.69	0.92	2.85	0.87	2.81	0.87	2.81	0.79

Note: *N*'s = 14 year olds: 995, 15 year olds: 672, 16 year olds: 899, 17 year olds: 611, 18 year olds: 590

prior to further analysis due to poor internal consistency. For constructs with more than two variables, a principal components analysis was used to identify those variables with loadings of .50 or greater on the construct. A cut-off of .50 was selected as this is the commonly accepted indicator of a strong correlation between the variables (Cohen & Cohen, 1983). Two of the constructs, temperament and academic orientation, resulted in two components each (see Table 12). Component scores were computed by averaging standardized scores for these predictors using a unit-weighting procedure (Grice & Harris, 1998; Grice, 2001). For constructs composed of two measures, scores were standardized and averaged. Single measures also were standardized prior to analysis. The final analysis, therefore, was based on 21 predictors. Table 12 displays the 55 original variables sorted by construct, as well as the factor loadings for constructs with three or more indicators. Correlations among the final predictors and gambling involvement were low to moderate (See Table 13).

Regression analyses were conducted to assess the overall amount of variance in gambling frequency explained by the set of 21 predictors, as well as the individual contribution of each predictor in the context of the other variables. The continuous measure of a composite score of overall gambling involvement was regressed onto the 21 predictors. Multiple regression models were computed for the full sample (3,767 participants) as well as for each gender and age.

Predictors were entered into each regression model in a single block to avoid capitalization on chance associations among variables (Thompson, 1995). Given the

Table 12.

Principal Component Loadings by Construct

Construct	Variable	Component	Variance Accounted for	Loading
Age	Age			--
Gender	Gender			--
Background	Background			--
Temperament	Rhythmicity	1	32.6 %	.51
	Distractibility	1		.68
	Persistence	1		.75
	Approach	2	22.8 %	.65
	Activity level	2		.64
	Mood	2		.58
Parental education	Father's education			--
	Mother's education			--
Neighborhood quality	Sense of neighborhood			--
Substance availability	School availability			--
	Neighborhood availability			--
School culture	School culture			--
Parental monitoring	Weekday curfew	1	57.1%	.88
	Weekend curfew	1		.89
	Parents ask	1		-.39*
Parental Relationship	Attachment to mother	1	53.5%	.75
	Attachment of father	1		.71
	Have fun with parents	1		.74
	Talk with parents	1		.80
	Parental knowledge of activities	1		.65
Peer victimization	Direct victimization			--
	Indirect victimization			--
Friendship quality	Best friendship quality			--
	Friendship quality			--
Sibling risk behavior	Sibling risk behavior			--
Academic orientation	Grades	1	34.2%	.68
	Educational goals	1		-.62
	Importance of doing well –self	1		.80
	Planfulness	1		.58
	Bored at school	1		-.53
	Importance of doing well – parents	2	15.9%	.66
	Importance of doing well - friends	2		.62
Religiosity	Spirituality			--
	Attendance at religious services			--
Structured activities	Sports at school	1	45.0 %	.54
	Sports outside of school	1		.69
	Clubs at school	1		.74
	Clubs outside of school	1		.70
Well-being	Depression	1	53.3%	.81
	Social anxiety	1		.52
	Self-esteem	1		.87
	Life Satisfaction	1		.76
	Daily hassles	1		.63
Unstructured activities	Partying	1	50.5%	.79
	Hanging out with friends	1		.74
	Skipping classes	1		.60
	Dating	1		.69
Risk attitudes / perceptions	Parents upset by risk	1	51.6%	.70
	Friends upset by risk	1		.77
	How wrong / Tolerance	1		.68
	Risky for you	1		.68
	Risky for others	1		.76

Note. N= 3,767. * Variables with loadings < .50 were excluded from the component scores.

Table 13.

Correlations Among 21 Predictors and with Gambling Involvement

Variable	1	2	3	4
1. Age	--			
2. Gender	.023	--		
3. Background	.044	.049	--	
4. Rhymicity/distractability/persistence	-.047	.081*	.025	--
5. Approach/activity/mood	.002	-.054*	-.014	-.050
6. Parental Education	.061*	-.036	.007	-.118*
7. Neighbourhood Quality	.076*	.023	.062*	.200*
8. Substance Availability	.159*	-.031	.014	.117*
9. School Culture	.004	-.018	.021	.246*
10. Parental Monitoring	.061*	-.122*	-.033	-.029
11. Parental Relationship	.051	-.062*	.036	.325*
12. Peer Victimization	-.110*	-.181*	.018	.136*
13. Friendship Quality	-.078*	-.422*	-.038	.123*
14. Sibling Risk Behaviour	.067*	.010	.004	.131*
15. Academic Orientation	-.086*	-.189*	.009	.385*
16. Academic Importance to Others	.020	-.123*	-.021	.114*
17. Religiosity	.049	-.114*	.003	.150*
18. Structured Activities	.012	.048	.030	.158*
19. Well-being	-.043	.137*	.043	.343*
20. Unstructured Activities	-.180*	-.005	-.018	-.126*
21. Risk Attitudes/Perceptions	.117*	-.272*	.009	.259*
22. Gambling	.010	-.244*	-.035	.001

Note. * $p < .001$, two-tailed.

Table 13 Continued.

Correlations Among 21 Predictors and with Gambling Involvement

Variable	5	6	7	8
1. Age				
2. Gender				
3. Background				
4. Rhymicity/distractability/persistence				
5. Approach/activity/mood	--			
6. Parental Education	-.035	--		
7. Neighbourhood Quality	.080*	-.122*	--	
8. Substance Availability	-.137*	-.062*	.162*	--
9. School Culture	.071*	-.058*	.367*	.270*
10. Parental Monitoring	-.011	.048	-.037	-.014
11. Parental Relationship	.053*	-.117*	.378*	.203*
12. Peer Victimization	-.063*	-.064*	.222*	.113*
13. Friendship Quality	.228*	-.044	.205*	-.005
14. Sibling Risk Behaviour	-.043	-.092*	.117*	.265*
15. Academic Orientation	.042	-.273*	.237*	.119*
16. Academic Importance to Others	.096*	-.037	.175*	.090*
17. Religiosity	.029	-.102*	.134*	.134*
18. Structured Activities	.148*	-.201*	.156*	-.002
19. Well-being	.098*	-.122*	.341*	.084*
20. Unstructured Activities	.244*	.012	-.036	-.252*
21. Risk Attitudes/Perceptions	.020	-.110*	.228*	.308*
22. Gambling	-.062*	-.007	.019	.099*

Note. *$p < .001$, two-tailed.

Table 13 Continued.

Correlations Among 21 Predictors and with Gambling Involvement

Variable	9	10	11	12
1. Age				
2. Gender				
3. Background				
4. Rhymicity/distractability/persistence				
5. Approach/activity/mood				
6. Parental Education				
7. Neighbourhood Quality				
8. Substance Availability				
9. School Culture	--			
10. Parental Monitoring	-.047	--		
11. Parental Relationship	.369*	-.118*	--	
12. Peer Victimization	.196*	.006	.241*	--
13. Friendship Quality	.236*	.033	.328*	.245*
14. Sibling Risk Behaviour	.142*	-.013	.178*	.091*
15. Academic Orientation	.271*	-.043	.349*	.156*
16. Academic Importance to Others	.266*	-.065*	.200*	.062*
17. Religiosity	.157*	-.042	.222*	.027
18. Structured Activities	.127*	-.046	.128*	-.005
19. Well-being	.290*	-.029	.485*	.356*
20. Unstructured Activities	-.100*	.022	-.088*	-.015
21. Risk Attitudes/Perceptions	.301*	-.008	.352*	.144*
22. Gambling	.069*	.094*	.036	.143*

Note. * $p < .001$, two-tailed

Table 13 Continued.

Correlations Among 21 Predictors and with Gambling Involvement

Variable	13	14	15	16
1. Age				
2. Gender				
3. Background				
4. Rhymicity/distractability/persistence				
5. Approach/activity/mood				
6. Parental Education				
7. Neighbourhood Quality				
8. Substance Availability				
9. School Culture				
10. Parental Monitoring				
11. Parental Relationship				
12. Peer Victimization				
13. Friendship Quality	--			
14. Sibling Risk Behaviour	.048	--		
15. Academic Orientation	.248*	.151*	--	
16. Academic Importance to Others	.289*	.058*	.260*	--
17. Religiosity	.123*	.128*	.213*	.108*
18. Structured Activities	.052	.078*	.247*	.108*
19. Well-being	.338*	.123*	.259*	.110*
20. Unstructured Activities	.174*	-.201*	-.164*	.082*
21. Risk Attitudes/Perceptions	.281*	.265*	.428*	.239*
22. Gambling	.163*	.120*	.087*	.011

Note. * $p < .001$, two-tailed.

Table 13 Continued.

Correlations Among 21 Predictors and with Gambling Involvement

Variable	17	18	19	20
1. Age				
2. Gender				
3. Background				
4. Rhymicity/distractability/persistence				
5. Approach/activity/mood				
6. Parental Education				
7. Neighbourhood Quality				
8. Substance Availability				
9. School Culture				
10. Parental Monitoring				
11. Parental Relationship				
12. Peer Victimization				
13. Friendship Quality				
14. Sibling Risk Behaviour				
15. Academic Orientation				
16. Academic Importance to Others				
17. Religiosity	--			
18. Structured Activities	.120*	--		
19. Well-being	.070*	.167*	--	
20. Unstructured Activities	-.168*	.107*	.049	--
21. Risk Attitudes/Perceptions	.344*	.125*	.155*	-.345*
22. Gambling	.075*	-.128*	.061*	-.191*

Note. * $p < .001$, two-tailed.

Table 13 Continued.

Correlations Among 21 Predictors and with Gambling Involvement

Variable	21	22
1. Age		
2. Gender		
3. Background		
4. Rhymicity/distractability/persistence		
5. Approach/activity/mood		
6. Parental Education		
7. Neighbourhood Quality		
8. Substance Availability		
9. School Culture		
10. Parental Monitoring		
11. Parental Relationship		
12. Peer Victimization		
13. Friendship Quality		
14. Sibling Risk Behaviour		
15. Academic Orientation		
16. Academic Importance to Others		
17. Religiosity		
18. Structured Activities		
19. Well-being		
20. Unstructured Activities		
21. Risk Attitudes/Perceptions	--	
22. Gambling	.199*	--

Note. * $p < .001$, two-tailed.

number of predictors and the sample size, there was an increased likelihood of Type I error. Further, the EM procedure used to impute missing data may underestimate standard errors and *p*-values for individual parameters (Allison, 2002). To compensate, individual predictors were considered statistically significant at $p \leq .001$.

The predictive utility of a given predictor was determined by squaring the semi-partial correlation (yielding the amount of unique variation in the dependent measure explained by a predictor in the context of the other variables). Given the number of predictors, and the low correlations among the predictors, the typical amount of unique criterion variance explained by any given predictor was small. Thus, a given predictor was considered "noteworthy" in the regression model if it was statistically significant ($p \leq .001$) and it explained at least 0.5% of unique variance in the dependent measure (i.e., the semi-partial correlation was at least .07). Standardized regression weights could not be used as an index of relative contribution of these variables given that the variables were each standardized prior to analysis.

However, semi-partial correlations are context dependent (i.e., they will change as a result of the other variables in the regression model). Relying solely on regression weights or semi-partial correlations may result in overlooked explanatory variables that are statistically interchangeable with other predictors (and therefore redundant in terms of explaining variance in the criterion). These variables may be valuable to understanding the dependent measure of interest and relations among the predictor variables, as well as understanding which predictors could produce similar estimates of criterion scores (Courville & Thompson, 2001; Dunlap & Landis, 1998).

Table 14.

Twenty-One Variables Predicting Gambling Behaviour for Model for Overall Data

Predictor	R^2	*Beta*	*p*	*r*	*sr*
	.152				
Age		-.009	.572	.013	-.009
Gender		**-.186**	**.000**	**-.246**	**-.147**
Background		-.023	.141	-.034	-.023
Rhymicity/distractability/persistence		-.040	.028	.006	-.034
Approach/activity/mood		-.041	.013	-.060	-.038
Parental Education		-.017	.309	-.009	-.016
Neighbourhood Quality		-.018	.330	.021	-.015
Substance Availability		.006	.713	.094	.006
School Culture		.025	.169	.068	.021
Parental Monitoring		.054	.001	.096	.052
Parental Relationship		**-.094**	**.000**	**.036**	**-.072**
Peer Victimization		.048	.006	.139	.043
Friendship Quality		**.095**	**.000**	**.171**	**.071**
Sibling Risk Behaviour		**.080**	**.000**	**.128**	**.075**
Academic Orientation		.003	.869	.093	.003
Academic Importance to Others		-.026	.123	.012	-.024
Religiosity		.015	.372	.079	.014
Structured Activities		**-.109**	**.000**	**-.121**	**-.101**
Well-Being		**.106**	**.000**	**.061**	**.078**
Unstructured Activities		**-.154**	**.000**	**-.192**	**-.129**
Risk attitudes/perceptions		.078	.000	.201	.058

Note. Measures were standardized prior to analysis.

Thus, zero-order correlations between each predictor and the dependent measure also are reported.

A total of 15.2% of the variance in gambling behavior was explained by the 21 predictors, $F(20, 3546) = 30.27, p < .001$. As displayed in Table 14, seven variables were noteworthy (in order of magnitude): gender (males > females), more involvement in unstructured activities, more involvement in structured activities, lower well-being, lower friendship quality, higher quality parental relationship, and perception of greater sibling engagement in risk behaviours.

Regression models also were conducted separately for each gender and age (see Tables 15 through 21). All models were statistically significant at $p < .001$, smallest $F(20, 533) = 4.46, p < .001$ for 18 year olds. The regression model explained a total of 13.4% of the variance in gambling behavior for males, 9.8% for females, 15.4% for those aged 14, 20.5% for those aged 15, 20.0% for those aged 16, 22.2% for those aged 17 and 14.3% for those aged 18. Within the models, the following variables were noteworthy: unstructured activities (male, female, 16, 17, 18), gender, (males > females, 14, 15, 16), parental relationship (male, 14, 15), perception of sibling risk behaviour (male, 14, 16), structured activities (male, female, 16), well-being (male, 14, 15), friendship quality (female), and risk attitudes/perceptions (female). See Table 22 for a summary of all the models.

Suppression was observed in some variables within the various models. Suppressors are variables that suppress variance not related to the criterion in other predictors (Tzelgov & Henik, 1991). In complex models, modest suppression effects are common and likely to be found in aggregate data (Cohen & Cohen, 1983). An

Table 15.

Twenty-One Variables Predicting Gambling Behaviour for Model for Males

Predictor	*F*	R^2	*Beta*	*p*	*r*	*sr*
	12.52	.134				
Age			-.060	.016	-.031	-.056
Background			-.010	.655	-.016	-.010
Rhymicity/distractability/persistence			-.052	.045	.028	-.046
Approach/activity/mood			-.068	.007	-.098	-.063
Parental Education			-.022	.359	-.033	-.021
Neighbourhood Quality			-.012	.665	.035	-.010
Substance Availability			.017	.521	.098	.015
School Culture			.018	.521	.069	.015
Parental Monitoring			.007	.776	.033	.007
Parental Relationship			**-.134**	**.000**	**.017**	**-.103**
Peer Victimization			.033	.209	.106	.029
Friendship Quality			.081	.005	.093	.065
Sibling Risk Behaviour			**.107**	**.000**	**.165**	**.099**
Academic Orientation			.004	.891	.060	.003
Academic Importance to Others			.010	.699	.004	.009
Religiosity			.014	.570	.054	.013
Structured Activities			**-.112**	**.000**	**-.119**	**-.103**
Well-Being			**.196**	**.000**	**.163**	**.150**
Unstructured Activities			**-.185**	**.000**	**-.216**	**-.155**
Risk attitudes/perceptions			.068	.020	.149	.054

Note. Measures were standardized prior to analysis.

Table 16.

Twenty-One Variables Predicting Gambling Behaviour for Model for Females

Predictor	*F*	R^2	*Beta*	*p*	*r*	*sr*
	10.29	.098				
Age			.060	.010	.088	.056
Background			-.041	.064	-.037	-.040
Rhymicity/distractability/persistence			-.017	.526	.034	-.014
Approach/activity/mood			-.012	.606	-.050	-.011
Parental Education			-.008	.727	.002	-.008
Neighbourhood Quality			-.017	.496	.019	-.015
Substance Availability			.006	.823	.082	.005
School Culture			.040	.124	.066	.034
Parental Monitoring			**.125**	**.000**	**.134**	**.123**
Parental Relationship			-.039	.166	.029	-.030
Peer Victimization			.072	.003	.089	.065
Friendship Quality			**.086**	**.001**	**.053**	**.071**
Sibling Risk Behaviour			.038	.103	.103	.036
Academic Orientation			.010	.719	.035	.008
Academic Importance to Others			-.072	.002	-.058	-.067
Religiosity			.018	.441	.057	.017
Structured Activities			**-.121**	**.000**	**-.114**	**-.111**
Well-Being			-.011	.704	.021	-.008
Unstructured Activities			**-.126**	**.000**	**-.188**	**-.104**
Risk attitudes/perceptions			**.098**	**.001**	**.149**	**.074**

Note. Measures were standardized prior to analysis.

Table 17.

Twenty-One Variables Predicting Gambling Behaviour for Model for 14 Year Olds

Predictor	*F*	R^2	*Beta*	*p*	*r*	*sr*
	8.53	.154				
Gender			**-.223**	**.000**	**-.250**	**-.173**
Background			-.005	.870	-.021	-.005
Rhymicity/distractability/persistence			-.063	.069	-.024	-.055
Approach/activity/mood			-.061	.060	-.076	-.057
Parental Education			.031	.334	.028	.029
Neighbourhood Quality			.005	.899	.028	.004
Substance Availability			.038	.252	.094	.035
School Culture			-.009	.813	.030	-.007
Parental Monitoring			.001	.982	.046	.001
Parental Relationship			**-.140**	**.001**	**.008**	**-.102**
Peer Victimization			.026	.445	.118	.023
Friendship Quality			.078	.061	.174	.056
Sibling Risk Behaviour			**.111**	**.001**	**.153**	**.102**
Academic Orientation			.007	.855	.051	.006
Academic Importance to Others			-.087	.008	-.050	-.080
Religiosity			.037	.259	.073	.034
Structured Activities			-.104	.002	-.111	-.095
Well-Being			**.147**	**.000**	**.066**	**.109**
Unstructured Activities			-.086	.014	-.141	-.074
Risk attitudes/perceptions			.087	.029	.170	.066

Note. Measures were standardized prior to analysis.

Table 18.

Twenty-One Variables Predicting Gambling Behaviour for Model for 15 Year Olds

Predictor	*F*	R^2	*Beta*	*p*	*r*	*sr*
	7.95	.205				
Gender			**-.286**	**.000**	**-.299**	**-.212**
Background			-.006	.873	-.014	-.006
Rhymicity/distractability/persistence			-.082	.056	-.044	-.069
Approach/activity/mood			-.089	.024	-.081	-.081
Parental Education			-.014	.716	-.005	-.013
Neighbourhood Quality			.018	.674	.036	.015
Substance Availability			-.021	.606	.053	-.019
School Culture			.064	.138	.051	.053
Parental Monitoring			.071	.060	.140	.068
Parental Relationship			**-.208**	**.000**	**-.037**	**-.157**
Peer Victimization			-.041	.316	.057	-.036
Friendship Quality			.071	.166	.188	.050
Sibling Risk Behaviour			.073	.065	.122	.066
Academic Orientation			.048	.316	.113	.036
Academic Importance to Others			-.006	.883	.023	-.005
Religiosity			.031	.438	.067	.028
Structured Activities			-.116	.003	-.149	-.105
Well-Being			**.217**	**.000**	**.066**	**.154**
Unstructured Activities			-.141	.002	-.172	-.112
Risk attitudes/perceptions			.029	.557	.176	.021

Note. Measures were standardized prior to analysis.

Table 19.

Twenty-One Variables Predicting Gambling Behaviour for Model for 16 Year Olds

Predictor	*F*	R^2	*Beta*	*p*	*r*	*sr*
	10.29	.200				
Gender			**-.222**	**.000**	**-.270**	**-.172**
Background			-.011	.739	-.037	.010
Rhymicity/distractability/persistence			.044	.233	.039	.037
Approach/activity/mood			.005	.873	-.404	.005
Parental Education			-.010	.764	.016	-.009
Neighbourhood Quality			-.065	.068	-.017	-.057
Substance Availability			.015	.686	.114	.013
School Culture			.046	.214	.087	.039
Parental Monitoring			.064	.044	.089	.063
Parental Relationship			-.020	.610	.070	-.016
Peer Victimization			.091	.011	.199	.079
Friendship Quality			.091	.031	.175	.067
Sibling Risk Behaviour			**.155**	**.000**	**.187**	**.143**
Academic Orientation			-.086	.027	.053	-.069
Academic Importance to Others			-.008	.822	.042	-.007
Religiosity			-.055	.104	.012	-.051
Structured Activities			**-.114**	**.001**	**-.133**	**-.104**
Well-Being			.071	.092	.065	.052
Unstructured Activities			**-.165**	**.000**	**-.193**	**-.139**
Risk attitudes/perceptions			.082	.048	.214	.062

Note. Measures were standardized prior to analysis.

Table 20.

Twenty-One Variables Predicting Gambling Behaviour for Model for 17 Year Olds

Predictor	*F*	R^2	*Beta*	*p*	*r*	*sr*
	7.69	.222				
Gender			-.138	.004	-.274	-.107
Background			-.024	.544	-.063	-.023
Rhymicity/distractability/persistence			-.018	.683	.052	-.015
Approach/activity/mood			.033	.442	.027	.029
Parental Education			-.056	.167	-.066	-.052
Neighbourhood Quality			-.066	.133	.016	-.056
Substance Availability			-.017	.691	.106	-.015
School Culture			.022	.633	.126	.018
Parental Monitoring			.086	.028	.144	.082
Parental Relationship			-.038	.439	.100	-.029
Peer Victimization			.099	.020	.211	.087
Friendship Quality			.142	.006	.252	.104
Sibling Risk Behaviour			.044	.277	.100	.041
Academic Orientation			.058	.236	.207	.044
Academic Importance to Others			.001	.979	.080	.001
Religiosity			.019	.658	.142	.017
Structured Activities			-.088	.036	-.070	-.079
Well-Being			.067	.187	.093	.050
Unstructured Activities			**-.250**	**.000**	**-.274**	**-.209**
Risk attitudes/perceptions			.049	.356	.283	.035

Note. Measures were standardized prior to analysis.

Table 21.

Twenty-One Variables Predicting Gambling Behaviour for Model for 18 Year Olds

Predictor	*F*	R^2	*Beta*	*p*	*r*	*sr*
	4.46	.143				
Gender			-.011	.815	-.110	-.009
Background			-.047	.243	-.035	-.047
Rhymicity/distractability/persistence			-.061	.201	.040	-.051
Approach/activity/mood			-.101	.018	-.137	-.095
Parental Education			-.081	.051	-.082	-.078
Neighbourhood Quality			.028	.542	.067	.024
Substance Availability			-.010	.817	.108	-.009
School Culture			.030	.524	.086	.026
Parental Monitoring			.063	.128	.084	.061
Parental Relationship			.001	.977	.073	.001
Peer Victimization			.060	.183	.143	.053
Friendship Quality			.079	.134	.064	.060
Sibling Risk Behaviour			-.066	.122	.003	-.062
Academic Orientation			.045	.359	.126	.037
Academic Importance to Others			-.031	.487	.000	-.028
Religiosity			.086	.053	.142	.078
Structured Activities			-.132	.033	-.133	-.120
Well-Being			.010	.850	.008	.008
Unstructured Activities			**-.192**	**.000**	**-.248**	**-.161**
Risk attitudes/perceptions			.083	.118	.202	.063

Note. Measures were standardized prior to analysis.

Table 22.

Summary of Twenty-One Variables Predicting Gambling Behaviour for Eight Models

Predictor	Overall	Male	Female	14	15	16	17	18
Age								
Gender	X			X	X	X		
Background								
Rhymicity/distractability/persistence								
Approach/activity/mood								
Parental Education								
Neighbourhood Quality								
Substance Availability								
School Culture								
Parental Monitoring			X					
Parental Relationship	X	X		X	X			
Peer Victimization								
Friendship Quality	X		X					
Sibling Risk Behaviour	X	X		X		X		
Academic Orientation								
Academic Importance to Others								
Religiosity								
Structured Activities	X	X	X			X		
Well-Being	X	X		X	X			
Unstructured Activities	X	X	X			X	X	X
Risk attitudes/perceptions			X					

examination of the correlations among the independent variables and gambling behaviour revealed low to moderate correlations. Given these relations, it is possible that no single variable was the cause of the suppression situation; instead a combination of variables may have produced the effect.

Description of Groups of Gamblers

Prevalence of Groups of Gamblers

Participants were divided into four gambling groups, 1) no-involvement (non-gamblers), 2) low-risk gamblers, 3) at-risk gamblers, and 4) high-risk/problematic gamblers (see p. 61 for details on classification procedures and Table 23 for summary of classification). Of the 3,767 participants in this sample, 1,462 (38.8%) were classified as no involvement (non-gamblers), 1,330 (35.3%) were classified as low-risk gamblers, 690 (18.3%) were classified as at-risk gamblers, and 309 (8.2%) were classified as high-risk/problematic gamblers. The percentage of high-risk/problem gamblers is consistent with past research (Derevensky & Gupta, 2000a; Gupta & Derevensky, 1998a; Winters, Stinchfield, & Fulkerson, 1993b). Also consistent with past research (Gupta & Derevensky, 2001), gender differences were seen among the gambling groups with more males classified in the at-risk and high-risk/problematic gambling groups than females (at-risk gamblers: 21.5% vs. 15.6%; high-risk/problematic gamblers: 14.1% vs. 3.3%). See Table 24 for percentage of students within each gambling group by age and gender.

The frequency of experiencing consequences also was examined among the at-risk and high-risk/problem gambling groups. Of the 690 at-risk gamblers, 14.8% reported experiencing no consequences, 66.5% reported one consequence, 14.1%

Table 23.

Summary of Classification of the Four Gambling Groups

Number of Consequences	Frequency of Gambling				
	Never	Monthly	Weekly	2 times or more/week	Daily
0	1	2	2	3	4
1	3	3	3	3	4
2	3	3	4	4	4
3	3	3	4	4	4
4+	4	4	4	4	4

Note: 1 = no involvement/non-gambler, 2 = low-risk gambler, 3 = at=risk gambler, 4 = high-risk/problem gambler

Table 24.

Classification of Participants According to Level of Gambling Risk by Gender and Age

Group	Overall	Male	Female	14	15	16	17	18
	N = 3767	*N* = 1722	*N* = 2045	*N*=995	*N*=666	*N*=899	*N*=611	*N*=590
1	38.2%	30.3%	44.8%	40.8%	37.9%	40.0%	38.0%	31.4%
	(1462)	(521)	(917)	(406)	(255)	(360)	(232)	(185)
2	35.3%	34.2%	36.2%	34.5%	37.6%	31.3%	35.2%	40.3%
	(1330)	(589)	(741)	(343)	(253)	(281)	(215)	(238)
3	18.3%	21.5%	15.6%	16.2%	16.7%	19.8%	19.3%	20.5%
	(690)	(370)	(320)	(161)	(112)	(178)	(118)	(121)
4	8.2%	14.1%	3.3%	8.5%	7.7%	8.9%	7.5%	7.8%
	(309)	(242)	(67)	(85)	(52)	(80)	(46)	(46)

Note. Group 1 = no-involvement/non-gamblers; Group 2 = low-risk gamblers; Group 3 = at-risk gamblers; Group 4 = high-risk/problem gamblers. Number of participants is in parentheses.

reported experiencing two consequences and 4.6% reported experiencing three consequences. Of the 309 high-risk/problematic gamblers, 14.9% reported experiencing no consequences, 4.2% reported experiencing one consequence, 24.9% reported experiencing two consequences, 11.3% reported experiencing three consequences, and 44.6% reported experiencing four or more consequences within the past year.

Type of Gambling Activity as a Function of Gambling Group

To examine whether the type of gambling activities differed as a function of gambling group, the groups containing gamblers (groups 2, 3, 4) were assessed. Group 1 contained non-gamblers and were excluded from the analyses. An 8 x 2 x 5 x 3 MANOVA was conducted with type of activity (playing cards for money, playing pokemon, buying lottery tickets, betting on sports, entering draws, going to bingo, betting on horse races, going to the casino) as the dependent variables and gender, age (14, 15, 16, 17, 18), and gambling group (low-risk, at-risk, high-risk/problematic) as the independent variables (See Tables 5, 6, and 25 for means and standard deviations). Using Wilks' criterion, main effects were found for gender, $F(8, 2292) = 24.39, p < .001$, age, $F(32, 8454) = 9.08, p < .001$ and gambling group, $F(16, 4584) = 32.18, p < .001$.

The gender main effect was significant for playing cards for money, betting on sports, betting on horse races, and going to the casino, with males reporting participation in each of these activities more frequently than females, smallest $F(1, 2299) = 15.55, p < .001$ for going to the casino. The age main effect was significant for playing pokemon, buying lottery tickets, and entering draws, smallest $F(4, 2299)$

Table 25.

Means and Standard Deviations (in Parentheses) of Gambling Activities by Gambling Group

	Gambling Group		
Activity	Low-risk	At-risk	High-risk/problem
Composite gambling activity	1.23 (0.21)	1.30 (0.30)	1.96 (0.77)
Playing cards	1.51 (0.64)	1.75 (1.00)	2.66 (1.43)
Playing pokemon	1.09 (0.34)	1.12 (0.50)	1.73 (1.25)
Buying lottery tickets	1.42 (0.57)	1.53 (0.72)	2.23 (1.21)
Betting on sports	1.23 (0.50)	1.40 (0.77)	2.37 (1.34)
Entering draws	1.45 (0.54)	1.40 (0.62)	2.00 (1.19)
Going to bingos	1.07 (0.28)	1.07 (0.30)	1.52 (1.03)
Betting on horse races	1.05 (0.24)	1.07 (0.30)	1.56 (1.10)
Going to casinos	1.06 (0.26)	1.08 (0.32)	1.58 (1.15)

Note. Means and standard deviations for gamblers only are reported. Low-risk: n = 1,330; at-risk: n = 690; high-risk/problem: n = 309. Non-transformed scores are reported.

= 5.09, $p < .001$ for entering draws. Follow-up Tukey analyses revealed no significant differences among the age groups for playing pokemon. For buying lottery tickets, 18 year olds reported significantly more frequent purchases than students aged 17 and younger. There were no other significant age differences. For entering draws, students aged 14 reported significantly more frequent participation than adolescents aged 16 or 18. There were no other significant age differences. See Table 26 for means and standard deviations of interactions.

The group main effect was significant for all gambling activities, smallest $F(2, 2299) = 30.66$, $p < .001$ for entering draws. Follow-up Tukey's analyses revealed that for all activities except betting on sports, problem gamblers reported more frequent involvement than adolescents in either the at-risk or low-risk gambling groups. There were no significant differences between adolescents in the low-risk group and those in the at-risk group. For betting on sports, problem gamblers reported more frequent involvement than adolescents in either the at-risk or low-risk gambling groups, and adolescents in the at-risk gambling group reported more frequent involvement in each activity than adolescents in the low-risk gambling group.

Main effects were qualified by two significant two-way interactions, age by group, $F(64, 13226) = 2.16$, $p < .001$ and gender by group, $F(16, 4584) = 3.25$, $p < .001$. The three way interaction, age by gender by group was not significant, $F(64, 13226) = 1.15$, $p = .189$. The age by group interaction was significant for playing pokemon and going to the casino, smallest $F(8, 2299) = 3.25$, $p = .001$ for going to

Table 26.

Means and Standard Deviations (in Parentheses) of Gambling Activities for the Two-Way Interactions Age by Gambling Group and Gender by Gambling Group

Gambling Activity	Gambling Group	Age					Gender	
		14	15	16	17	18	Male	Female
Playing cards	2	1.52 (0.64)	1.56 (0.67)	1.55 (0.65)	1.56 (0.68)	1.31 (0.54)	1.65 (0.70)	1.39 (0.57)
	3	1.80 (1.05)	1.98 (1.13)	1.71 (0.99)	1.74 (0.95)	1.55 (0.86)	1.91 (1.03)	1.57 (0.94)
	4	2.72 (1.53)	2.73 (1.40)	2.56 (1.28)	2.71 (1.45)	2.57 (1.54)	2.68 (1.40)	2.55 (1.53)
Playing pokemon	2	1.11 (0.37)	1.11 (0.37)	1.07 (0.28)	1.05 (0.28)	1.11 (0.36)	1.11 (0.37)	1.08 (0.30)
	3	1.16 (0.58)	1.17 (0.60)	1.09 (0.42)	1.14 (0.52)	1.07 (0.35)	1.15 (0.59)	1.08 (0.36)
	4	2.11 (1.53)	1.87 (1.27)	1.46 (0.95)	1.72 (1.22)	1.33 (0.90)	1.75 (1.29)	1.64 (1.10)
Buying lottery tickets	2	1.34 (0.53)	1.31 (0.54)	1.35 (0.53)	1.45 (0.56)	1.70 (0.62)	1.40 (0.59)	1.43 (0.55)
	3	1.33 (0.60)	1.35 (0.62)	1.60 (0.80)	1.46 (0.66)	1.90 (0.76)	1.52 (0.70)	1.53 (0.75)
	4	2.20 (1.34)	2.05 (1.29)	2.24 (1.16)	2.05 (1.02)	2.67 (1.06)	2.23 (1.22)	2.26 (1.19)

Note. Means and standard deviations for gamblers only are reported. Group 2: Low-risk: $n = 1330$; Group 3: at-risk: $n = 690$; Group 4: high-risk/problem: $n = 309$. Non-transformed scores are reported.

Table 26 Continued.

Means and Standard Deviations (in Parentheses) of Gambling Activities for the Two-Way Interactions Age by Gambling Group and Gender by Gambling Group

Gambling Activity	Gambling Group	Age					Gender	
		14	15	16	17	18	Male	Female
Betting on sports	2	1.24 (0.52)	1.33 (0.61)	1.21 (0.46)	1.18 (0.44)	1.18 (0.42)	1.35 (0.59)	1.14 (0.39)
	3	1.45 (0.83)	1.62 (0.96)	1.36 (0.72)	1.31 (0.62)	1.24 (0.63)	1.55 (0.82)	1.22 (0.66)
	4	2.42 (1.45)	2.53 (1.42)	2.40 (1.27)	2.32 (1.26)	2.09 (1.23)	2.61 (1.37)	1.49 (0.74)
Entering draws	2	1.56 (0.57)	1.46 (0.56)	1.39 (0.53)	1.46 (0.53)	1.35 (0.48)	1.44 (0.57)	1.46 (0.52)
	3	1.51 (0.75)	1.47 (0.63)	1.39 (0.63)	1.29 (0.45)	1.29 (0.52)	1.43 (0.64)	1.36 (0.60)
	4	2.16 (1.29)	2.11 (1.37)	1.85 (1.06)	1.96 (1.15)	1.85 (1.05)	2.06 (1.25)	1.76 (0.90)
Going to bingos	2	1.06 (0.28)	1.06 (0.25)	1.05 (0.22)	1.04 (0.23)	1.15 (0.38)	1.07 (0.31)	1.06 (0.25)
	3	1.08 (0.32)	1.08 (0.35)	1.04 (0.19)	1.08 (0.37)	1.07 (0.25)	1.08 (0.32)	1.06 (0.26)
	4	1.48 (1.09)	1.46 (0.98)	1.55 (1.02)	1.74 (1.08)	1.39 (0.93)	1.57 (1.09)	1.34 (0.77)

Note. Means and standard deviations for gamblers only are reported. Group 2: Low-risk: $n = 1330$; Group 3: at-risk: $n = 690$; Group 4: high-risk/problem: $n = 309$. Non-transformed scores are reported.

Table 26 Continued.

Means and Standard Deviations (in Parentheses) of Gambling Activities for the Two-Way Interactions Age by Gambling Group and Gender by Gambling Group

Gambling Activity	Gambling Group	Age					Gender	
		14	15	16	17	18	Male	Female
Betting on horse races	2	1.06 (0.27)	1.07 (0.27)	1.05 (0.25)	1.03 (0.21)	1.03 (0.16)	1.06 (0.28)	1.04 (0.20)
	3	1.07 (0.32)	1.08 (0.43)	1.08 (0.31)	1.04 (0.20)	1.03 (0.16)	1.09 (0.38)	1.03 (0.16)
	4	1.71 (1.24)	1.45 (1.02)	1.54 (1.00)	1.74 (1.25)	1.28 (0.83)	1.63 (1.16)	1.31 (0.80)
Going to casinos	2	1.03 (0.20)	1.47 (0.22)	1.05 (0.26)	1.03 (0.21)	1.16 (0.37)	1.07 (0.30)	1.05 (0.23)
	3	1.03 (0.17)	1.04 (0.30)	1.05 (0.29)	1.09 (0.37)	1.18 (0.45)	1.09 (0.33)	1.06 (0.31)
	4	1.72 (1.36)	1.75 (1.35)	1.43 (0.94)	1.59 (1.15)	1.37 (0.71)	1.63 (1.21)	1.37 (0.88)

Note. Means and standard deviations for gamblers only are reported. Group 2: Low-risk: $n = 1330$; Group 3: at-risk: $n = 690$; Group 4: high-risk/problem: $n = 309$. Non-transformed scores are reported.

the casino. Post hoc analysis indicated that for playing pokemon and going to the casino, there were no significant differences among the groups for adolescents aged 18. However, significant differences were found among the groups for those adolescents aged 14, 15, 16, and 17, where adolescents in the high-risk/problem gambling group reported playing pokemon and going to the casino significantly more frequently than those in low-risk or at-risk groups. There were no other significant differences.

The gender by group interaction was significant only for betting on sports, $F(2, 2299) = 18.43, p < .001$. Follow-up analyses revealed significant gender differences (males>females) for each group, smallest $F(1, 688) = 45.14, p < .001$ for the at-risk group.

Type of Gambling Consequences as a Function of Gambling Group

To examine the experience of gambling consequences by gambling group, only groups containing gamblers with some gambling consequences (at-risk and high-risk/problem gamblers) were selected. As two groups (non-gamblers and low-risk gamblers) included gamblers who had not experienced any consequences, adolescents in these groups were excluded from analyses.

A 6 x 2 x 5 x 2 MANOVA was conducted with consequences (spent more than they wanted to, tried to win back lost money, tried and could not stop gambling, had arguments with friends/family because of gambling, borrowed money to gamble and did not pay it back, felt unhappy about gambling behaviour) as the dependent variables and gender, age (14, 15, 16, 17, 18), and gambling group (at-risk, high-risk/problem gambler) as the independent variables. See Tables 5, 7, and 27 for

Table 27.

Means and Standard Deviations (in Parentheses) of Gambling Consequences by Gambling Group

	Gambling Group	
Consequence	At-risk	High-risk/problem
Composite gambling consequences	1.20 (0.16)	1.76 (0.65)
Spend more than wanted to	1.32 (0.52)	1.89 (0.86)
Trying to win back losses	1.48 (0.60)	2.07 (0.90)
Not being able to stop	1.04 (0.26)	1.70 (0.90)
Arguing with others	1.04 (0.23)	1.61 (0.84)
Borrowing money	1.29 (0.53)	1.69 (0.92)
Feeling unhappy	1.04 (0.22)	1.61 (0.84)

Note. Only groups of gamblers who experienced consequences are reported. At-risk: $n = 690$; High-risk/problem: $n = 309$. Non-transformed scores are reported.

means and standard deviations. Using Wilks's criterion, main effects were found for gender, $F(6, 974) = 6.17, p < .001$, age, $F(24, 3399) = 3.76, p < .001$ and gambling group, $F(6, 974) = 60.64, p < .001$. No two-way or three-way interactions were significant, largest $F(24, 3399) = 1.57, p = .038$, for gender by group.

For the gender main effect, only the consequence feeling unhappy about their gambling behaviour was significant with males reporting experiencing feeling unhappy about their gambling behaviour more frequently than females, $F(1, 979) = 18.32, p < .001$. For the age main effect, the consequences of spending more money than they wanted to and borrowing money to gamble and not paying it back were significant, smallest $F(4, 979) = 7.55, p < .001$ for spending more money than they wanted to spend. Follow-up Tukey's analyses revealed that for the consequence of spending more than they wanted to on gambling, students aged 15 reported experiencing this consequence less often than students aged 18. There were no other significant age differences. For the consequence of borrowing money to gamble and not paying it back, follow-up analyses revealed that 18 year olds reported experiencing this consequence less often than students aged 14 or 15. There were no other significant age differences. For the group main effect, significant differences were found for all consequences, smallest $F(1, 979) = 45.09, p < .001$ for borrowing money to gamble and not paying it back, with problem gamblers experiencing all consequences more frequently than at-risk gamblers.

Variables that Discriminate Among Gambling Groups

Discriminant function analyses (DFA) were performed to describe the separation among the four groups of gamblers (non-gamblers, low-risk gamblers, at-

risk gamblers, and high-risk/problematic gamblers) using the same 21 predictors as in the multiple regression analyses. These analyses assessed the overall amount of variance explained by the separation among groups captured by the discriminant functions, and the contribution of each predictor to the separation among risk levels in the context of the other variables.

Models were based on all respondents, and predictors were entered into each model in a single block. With four groups, three discriminant functions were extracted. Discriminant functions were considered statistically significant at $p \leq .001$. The relative usefulness of a given predictor in a DFA model was determined by the standardized discriminant function coefficients (analogous to standardized regression weights). Structure coefficients (correlations between a predictor and the discriminant function) also are reported to identify other variables that may have meaningful correlations with the discriminant function, but may not have noteworthy function weights (Courville & Thompson, 2001; Dunlap & Landis, 1998). In light of the number of predictors in the DFA model, a variable was considered 'noteworthy' if the standardized function coefficient was .15 or greater, and the structure coefficient was .30 or greater (M. Busseri, personal communication, April 8, 2003). For noteworthy variables, one-way ANOVA's and Tukey pairwise comparisons were used to test for mean differences across risk levels, and between pairs of risk levels respectively. Given the number of comparisons, differences were considered significant at $p \leq .001$.

Assumptions

Discriminant function analyses have seven assumptions which should be met (Klecka, 1980). The first two assumptions, that there are two or more groups and that there are at least two cases per group, were met. The third assumption, that there are fewer discriminating variables than the total number of cases minus two, was met. The fourth assumption, that the discriminating variables were measured at the interval level, was met for all variables except background. The impact of this violation may be that this variable may have reduced power to discriminate among the levels and may increase the potential of Type I error. To correct for this violation, a more stringent alpha level was used ($p < .001$) (Tabachnick & Fidell, 2001). The fifth assumption, that no discriminating variables were a linear combination of the other discriminating variables, was met. The sixth assumption that the covariances for each group were approximately equal was not met. While discriminant function analyses are robust to this violation (Klecka, 1980; Tabachnick & Fidell, 2001), a potential impact would be that the results for the 'high' risk group of gamblers in the separate model analysis (by gender and age) may not be as stable as the overall results. An investigation of the differences in variances among the four groups of gamblers with each individual predictor revealed consistent variances among the groups for all variables except for background. This suggests that the difference in group size should not be of concern. The seventh assumption of multivariate normality was not met for all variables. For three variables, the kurtosis was greater than one: school culture, peer victimization, and sibling risk behaviours. For two variables, skewness was greater than one: peer victimization and sibling risk behaviours. The impact of

this assumption violation also is a potential reduction in statistical power. Overall, given the statistical power offered by the sample size and the corrections made to account for a potential increases in Type I error, the violations were not of sufficient concern to consider other statistical options.

Discriminating Among the Gambling Groups

To examine which variables best discriminate among the groups of gamblers (non-gamblers, low-risk gamblers, at-risk gamblers, and high-risk/problem gamblers) in the overall model, 21 predictors were simultaneously entered into discriminant function analyses. The group centroids for the three functions were: non-gamblers (.390, .132, .009), low-risk gamblers (.014, -.163, -.065), at-risk gamblers (-.348, -.077, .151), and high-risk/problematic gamblers (-1.083, .265, -.096) (see Table 28). Overall, the three functions explained 17.9% of the variance. The first discriminant function explained 85.7% (Wilkes $\Lambda = .825$, $\chi^2 = 681.88$, $df = 63$, $p < .001$) of the separation among groups and the second function explained 11.2% (Wilkes $\Lambda = .971$, $\chi^2 = 103.77$, $df = 40$, $p < .001$) of the separation among groups. The third function was non-significant (Wilkes $\Lambda = .994$, $\chi^2 = 22.78$, $df = 19$, $p = .247$). An examination of the centroids revealed that function 1 differentiated among the four groups with the greatest separation between the no involvement (non-gamblers) and the high-risk/problem gamblers. Function 2 differentiated most between the low-risk and high-risk/problem gamblers. See Table 29 for the results of the discriminant function analysis.

Variables making the largest contribution in the first function were gender, unstructured activities, friendship quality, and risk attitudes/perceptions. Follow-up

Table 28.

Summary of Significant Group Centroids and Variance Accounted for by the Significant Functions Within Each Model

Model	Function	Variance	Gambling Group			
			1	2	3	4
Overall	1	85.7%	.390	.014	-.348	-1.083
	2	11.2%	.132	-.163	-.077	.265
Male	1	76.4%	.399	.130	-.262	-.784
	2	17.3%	.201	-.170	-.160	.230
Female	1	72.1%	-.311	.129	.374	.999
	2	17.3%	.088	-.182	.062	.521
14 Years	1	79.1%	.316	.010	-.200	-1.183
15 Years	1	77.0%	.579	-.148	-.423	-1.239
16 Years	1	81.8%	.384	.154	-.424	-1.321
17 Years	1	70.6%	.414	.074	-.399	-1.334
18 Years	1	64.1%	.529	-.069	-.397	-.684

Note: Gambling group 1 = no involvement/non-gamblers, gambling group 2 = low-risk gamblers, gambling group 3 = at-risk gamblers, gambling group 4 = high-risk/problematic gamblers.

Table 29.

Predictors Discriminating Among Four Groups of Gamblers for the Overall Sample

	Function 1			Function 2	
Predictor	SDFC	SC	Tukey	SDFC	SC
Age	-.028	-.083		-.219	-.279
Gender	**.405**	**.555**	**4<3<1; 4<2**	-.137	-.174
Background	.061	.073		.121	.123
Rhymicity/distractability/persistence	-.003	-.131		-.080	.195
Approach/activity/mood	.178	.189		**.248**	**.399**
Parental Education	.046	.030		-.031	-.195
Neighbourhood Quality	.086	-.070		-.087	.250
Substance Availability	.010	-.237		.146	.087
School Culture	-.079	-.207		.003	.310
Parental Monitoring	-.216	-.268		-.137	-.179
Parental Relationship	.113	-.197		.115	.446
Peer Victimization	-.124	-.327		.075	.329
Friendship Quality	**-.295**	**-.433**	**1,2,3<4**	.142	.541
Sibling Risk Behaviour	-.137	-.271		-.037	.032
Academic Orientation	.022	-.259		.148	.427
Academic Importance to Others	.083	-.047		**.226**	**.418**
Religiosity	-.031	-.216		-.275	-.118
Structured Activities	.277	.257		**.318**	**.466**
Well-Being	-.205	-.168		**.431**	**.636**
Unstructured Activities	**.395**	**.491**	**4<2<1; 3<1**	.110	.313
Risk attitudes/perceptions	**-.322**	**-.582**	**1,2<3<4**	-.017	.183

Note. SDFC = standardized discriminant function coefficient, SC = structure coefficient. Tukey's results indicate the significant differences among the gambling groups (1= non-gamblers, 2 = low-risk, 3 = at-risk, 4 = high=risk/problem). If a gambling group is not listed, there are no significant differences between that group and the other groups.

one-way ANOVAs revealed significant differences for all significant variables, smallest $F(3, 3763) = 54.78, p < .001$ for unstructured activities. Tukey's pairwise comparisons revealed that gender separated high-risk/problem gamblers from the at-risk, low-risk and no involvement gamblers, and separated the at-risk gamblers from no involvement (non-gamblers). Unstructured activities separated the high-risk/problem gamblers from the low-risk gamblers and the no involvement (non-gamblers), separated the low-risk gamblers from the no involvement group (non-gamblers), and separated the at-risk gamblers from the no involvement (non-gamblers). Friendship quality separated the no-involvement (non-gamblers), low-risk gamblers, and the at-risk gamblers from the high-risk/problem gamblers. Risk attitudes/perceptions separated the no-involvement (non-gamblers) and the low-risk gamblers from the at-risk and high-risk/problem gamblers, and the at-risk gamblers from the high-risk/problem gamblers. Variables making the largest contribution in the second function were approach/activity/mood, academic orientation, academic importance to others, structured activities, and well-being.

The discriminant function analysis also was conducted separately for each gender and age (for results of individual models, see Tables 30 through 36). The model for males explained a total of 18.1% of the variance. The first two functions were significant explaining a total of 93.8% of the explainable variance. The model for females explained a total of 13.3% of the variance in gambling. The first two functions were significant explaining 89.4% of the explainable variance. Across age, the model explained a total of 18.4%, 30.3%, 25.9%, 28.9%, and 22.4% of the variance in gambling for students 14, 15, 16, 17, and 18, respectively. Only the first function was significant across all ages, explaining 79.1%, 77.0%, 81.8%, 70.6%, and

Table 30.

Predictors Discriminating Among Groups of Gamblers for the Model for Males

	Function 1			Function 2	
Predictor	SDFC	SC	Tukey	SDFC	SC
Age	.118	.004		.005	-.043
Background	-.001	.012		.177	.163
Rhymicity/distractability/persistence	-.043	-.218		-.051	.186
Approach/activity/mood	**.251**	**.304**	**3,4,2<1**	**.433**	**.533**
Parental Education	.054	.053		.039	-.105
Neighbourhood Quality	.079	-.092		-.042	.325
Substance Availability	-.062	-.295		.164	.113
School Culture	-.120	-.245		-.025	.285
Parental Monitoring	-.173	-.195		-.019	-.049
Parental Relationship	.198	-.151		.094	.455
Peer Victimization	-.029	-.214		.109	.330
Friendship Quality	-.315	-.272		.032	.473
Sibling Risk Behaviour	**-.171**	**-.334**	**1,2<4**	-.021	.078
Academic Orientation	.077	-.150		.016	.281
Academic Importance to Others	.036	-.001		**.189**	**.354**
Religiosity	-.041	-.175		-.352	-.212
Structured Activities	**.327**	**.334**	**4,3<1**	**.177**	**.335**
Well-Being	**-.365**	**-.357**	**2,3,1<4**	**.539**	**.716**
Unstructured Activities	**.529**	**.627**	**4<2<1; 3<1**	.124	.291
Risk attitudes/perceptions	**-.304**	**-.497**	**1,2,3<4**	.153	.235

Note. SDFC = standardized discriminant function coefficient, SC = structure coefficient. Tukey's results indicate the significant differences among the gambling groups (1= non-gamblers, 2 = low-risk, 3 = at-risk, 4 = high=risk/problem). If a gambling group is not listed, there are no significant differences between that group and the other groups.

Table 31.

Predictors Discriminating Among Groups of Gamblers for the Model for Females

	Function 1			Function 2	
Predictor	SDFC	SC	Tukey	SDFC	SC
Age	.256	.292		-.101	-.185
Background	-.145	-.109		-.015	.017
Rhymicity/distractability/persistence	-.015	.217		-.107	.297
Approach/activity/mood	-.156	-.225		.036	.162
Parental Education	-.041	.047		-.060	-.295
Neighbourhood Quality	-.103	.088		-.206	.185
Substance Availability	-.069	.231		-.004	.078
School Culture	.064	.215		-.003	.323
Parental Monitoring	**.372**	**.351**	**1<4**	-.175	-.240
Parental Relationship	-.030	.232		**.301**	**.563**
Peer Victimization	**.307**	**.370**	**1,2,3<4**	**.219**	**.381**
Friendship Quality	.238	.203		**.302**	**.530**
Sibling Risk Behaviour	.118	.335		.028	.120
Academic Orientation	.044	.211		**.385**	**.628**
Academic Importance to Others	-.176	-.093		.110	.340
Religiosity	.079	.232		-.163	.049
Structured Activities	-.324	-.244		**.434**	**.569**
Well-Being	.045	.201		.043	.550
Unstructured Activities	**-.325**	**-.560**	**4,3<1**	.093	.107
Risk attitudes/perceptions	**.429**	**.578**	**1<3,4; 2<4**	.056	.334

Note. SDFC = standardized discriminant function coefficient, SC = structure coefficient. Tukey's results indicate the significant differences among the gambling groups (1= non-gamblers, 2 = low-risk, 3 = at-risk, 4 = high=risk/problem). If a gambling group is not listed, there are no significant differences between that group and the other groups.

Table 32.

Predictors Discriminating Among Groups of Gamblers for 14 Year Olds

	Function 1		
Predictor	SDFC	SC	Tukey
Gender	**.429**	**.561**	**4<3,2,1**
Background	.064	.073	
Rhymicity/distractability/persistence	.112	-.061	
Approach/activity/mood	.229	.203	
Parental Education	-.053	-.035	
Neighbourhood Quality	-.072	-.185	
Substance Availability	-.026	-.226	
School Culture	-.041	-.215	
Parental Monitoring	-.105	-.167	
Parental Relationship	.262	-.174	
Peer Victimization	-.105	-.345	
Friendship Quality	**-.297**	**-.521**	**1,2,3<4**
Sibling Risk Behaviour	**-.166**	**-.307**	**3,2,1<4**
Academic Orientation	.064	-.193	
Academic Importance to Others	.070	-.065	
Religiosity	-.102	-.233	
Structured Activities	.290	.254	
Well-Being	-.299	-.221	
Unstructured Activities	**.276**	**.391**	**4<3,2,1**
Risk attitudes/perceptions	**-.381**	**-.571**	**1,2,3<4**

Note. SDFC = standardized discriminant function coefficient, SC = structure coefficient. Tukey's results indicate the significant differences among the gambling groups (1= non-gamblers, 2 = low-risk, 3 = at-risk, 4 = high=risk/problem). If a gambling group is not listed, there are no significant differences between that group and the other groups.

Table 33.

Predictors Discriminating Among Groups of Gamblers for 15 Year Olds

	Function 1		
Predictor	SDFC	SC	Tukey
Gender	**.520**	**.574**	**4<2,1; 3<1**
Background	.035	.043	
Temperament 1	.017	-.056	
Temperament 2	.224	.203	
Parental Education	.016	.001	
Neighbourhood Quality	.018	-.035	
Substance Availability	.077	-.111	
School Culture	-.079	-.089	
Parental Monitoring	**-.307**	**-.366**	**1,3,2<4**
Parental Relationship	.307	-.022	
Peer Victimization	.034	-.122	
Friendship Quality	**-.154**	**-.328**	**2,1,3<4**
Sibling Risk Behaviour	-.103	-.217	
Academic Orientation	-.182	-.295	
Academic Importance to Others	.131	.040	
Religiosity	-.115	-.194	
Structured Activities	**.383**	**.364**	**NS**
Well-Being	-.260	-.056	
Unstructured Activities	**.275**	**.414**	**4,3<1**
Risk attitudes/perceptions	**-.280**	**-.478**	**1,2<4**

Note. SDFC = standardized discriminant function coefficient, SC = structure coefficient. Tukey's results indicate the significant differences among the gambling groups (1= non-gamblers, 2 = low-risk, 3 = at-risk, 4 = high=risk/problem). If a gambling group is not listed, there are no significant differences between that group and the other groups.

Table 34.

Predictors Discriminating Among Four Groups of Gamblers for 16 Year Olds

	Function 1		
Predictor	SDFC	SC	Tukey
Gender	**.604**	**.593**	**4<3,2,1; 3<1**
Background	-.013	.039	
Rhymicity/distractability/persistence	-.161	-.147	
Approach/activity/mood	.029	.074	
Parental Education	.075	.017	
Neighbourhood Quality	.174	.025	
Substance Availability	-.012	-.216	
School Culture	-.131	-.201	
Parental Monitoring	-.173	-.184	
Parental Relationship	-.009	-.205	
Peer Victimization	-.040	-.303	
Friendship Quality	**-.260**	**-.413**	**1,2,3<4**
Sibling Risk Behaviour	**-.336**	**-.355**	**1,2<4**
Academic Orientation	.247	-.159	
Academic Importance to Others	.069	-.095	
Religiosity	.125	-.086	
Structured Activities	.180	.163	
Well-Being	-.221	-.168	
Unstructured Activities	**.395**	**.388**	**4,3<1**
Risk attitudes/perceptions	**-.280**	**-.521**	**1,2<4**

Note. SDFC = standardized discriminant function coefficient, SC = structure coefficient. Tukey's results indicate the significant differences among the gambling groups (1= non-gamblers, 2 = low-risk, 3 = at-risk, 4 = high=risk/problem). If a gambling group is not listed, there are no significant differences between that group and the other groups.

Table 35.

Predictors Discriminating Among Groups of Gamblers for 17 Year Olds

	Function 1		
Predictor	SDFC	SC	Tukey
Gender	**.270**	**.486**	**4<2,1**
Background	.085	.131	
Rhymicity/distractability/persistence	-.033	-.182	
Approach/activity/mood	.121	.096	
Parental Education	.191	.157	
Neighbourhood Quality	.141	-.024	
Substance Availability	-.031	-.254	
School Culture	-.062	-.243	
Parental Monitoring	-.202	-.288	
Parental Relationship	.100	-.199	
Peer Victimization	-.145	-.371	
Friendship Quality	**-.378**	**-.460**	**2,1,3<4**
Sibling Risk Behaviour	-.048	-.165	
Academic Orientation	**-.152**	**-.411**	**2,1,3<4**
Academic Importance to Others	.131	-.063	
Religiosity	.021	-.215	
Structured Activities	.240	.160	
Well-Being	-.191	-.205	
Unstructured Activities	**.494**	**.556**	**4<2,1**
Risk attitudes/perceptions	**-.199**	**-.575**	**1,<3,4; 2<4**

Note. SDFC = standardized discriminant function coefficient, SC = structure coefficient. Tukey's results indicate the significant differences among the gambling groups (1= non-gamblers, 2 = low-risk, 3 = at-risk, 4 = high=risk/problem). If a gambling group is not listed, there are no significant differences between that group and the other groups.

Table 36.

Predictors Discriminating Among Groups of Gamblers for 18 Year Olds

	Function 1		
Predictor	SDFC	SC	Tukey
Gender	-.124	.088	
Background	.148	.100	
Rhymicity/distractability/persistence	.030	-.265	
Approach/activity/mood	**.364**	**.398**	**NS**
Parental Education	.082	.095	
Neighbourhood Quality	.023	-.135	
Substance Availability	.148	-.204	
School Culture	.031	-.154	
Parental Monitoring	-.190	-.165	
Parental Relationship	**-.246**	**-.358**	**NS**
Peer Victimization	**.338**	**-.473**	**1,2<4**
Friendship Quality	-.113	-.097	
Sibling Risk Behaviour	.010	-.173	
Academic Orientation	-.004	-.224	
Academic Importance to Others	.121	.085	
Religiosity	**-.274**	**-.374**	**NS**
Structured Activities	.207	.222	
Well-Being	-.099	-.181	
Unstructured Activities	**.516**	**.644**	**3,4<1**
Risk attitudes/perceptions	**-.201**	**-.457**	**1<4**

Note. SDFC = standardized discriminant function coefficient, SC = structure coefficient. Tukey's results indicate the significant differences among the gambling groups (1= non-gamblers, 2 = low-risk, 3 = at-risk, 4 = high=risk/problem). If a gambling group is not listed, there are no significant differences between that group and the other groups. NS = non-significant gambling group differences.

64.1% of the explainable variance for their age group (14, 15, 16, 17, 18 respectively). For all models, the first function differentiated among each of the four groups with the greatest separation between the no involvement (non-gamblers) and high-risk/problem gamblers. For the model for males and the model for females, function 2 differentiated the greatest between the low-risk and high risk/problem gamblers.

Within the seven models (male, female, 14, 15, 16, 17, 18), the following variables were noteworthy for function 1: unstructured activities (male, female, 14, 15, 16, 17, 18), risk attitudes/perceptions (male, female, 14, 15, 16, 17, 18), gender (14, 15, 16, 17), parental monitoring (female, 15), friendship quality (female, 14, 15, 16, 17), academic orientation (17), approach/activity/mood (male, female, 18), sibling risk behaviours (male, 14, 16), age (female), parental relationship (18), well-being (male), peer victimization (female, 18), religiosity (18), and structured activities (male, 15). For function 2, within the two models (male, female), the following variables were noteworthy: structured activities (male, female), approach/activity/mood (male), academic importance to others (male), well-being (male), parental relationship (female), peer victimization (female), friendship quality (female), and academic orientation (female). In the model for males, the predictors approach/activity/mood, structured activities, and well being were noteworthy and loaded on both functions. The loading for structured activities was evenly split between functions while the loadings for approach/activity/mood and well-being were greater on the second function. In the model for females, the predictor peer victimization was noteworthy and loaded on both functions; however, the loading was

Table 37.

Summary of 21 Components Discriminating Among Four Groups of Gamblers for Function 1

Predictor	Overall	Male	Female	14	15	16	17	18
Age								
Gender	X			X	X	X	X	
Background								
Rhymicity/distractability/persistence								
Approach/activity/mood		X						X
Parental Education								
Neighbourhood Quality								
Substance Availability								
School Culture								
Parental Monitoring			X		X			
Parental Relationship								X
Peer Victimization			X					X
Friendship Quality	X			X	X	X	X	
Sibling Risk Behaviour		X		X		X		
Academic Orientation							X	
Academic Importance to Others								
Religiosity								X
Structured Activities		X			X			
Well-Being		X						
Unstructured Activities	X	X	X	X	X	X	X	X
Risk attitudes/perceptions	X	X	X	X	X	X	X	X

Table 38.

Summary of 21 Components Discriminating Among Four Groups of Gamblers for Function 2

Predictor	Overall	Male	Female
Age			
Gender			
Background			
Rhymicity/distractability/persistence			
Approach/activity/mood	X	X	
Parental Education			
Neighbourhood Quality			
Substance Availability			
School Culture			
Parental Monitoring			
Parental Relationship			X
Peer Victimization			X
Friendship Quality			X
Sibling Risk Behaviour			
Academic Orientation			X
Academic Importance to Others	X	X	
Religiosity			
Structured Activities	X	X	X
Well-Being	X	X	
Unstructured Activities			
Risk attitudes/perceptions			

greater on the second function. In both the model for males and the model for females, the first function follow-up analyses revealed the most frequent separation was between the high-risk/problematic gamblers and the other groups of gamblers. For a summary of noteworthy predictors across models, see Tables 37 and 38.

Gambling Behaviour in Relation to Nine Other Risk Behaviours

Analysis

To compare co-occurrence between gambling and the other nine risk behaviours (alcohol use, smoking, marijuana use, hard drug use, sexual activity major delinquency, minor delinquency, direct aggression, and indirect aggression), participants were categorized into one of three levels of risk based on involvement in each behaviour. First, a distinction was made between participants reporting no involvement with a risk behavior and those reporting at least some involvement. Those reporting some involvement can be considered as 'at-risk' for negative outcomes typically associated with involvement with a given problem behavior. In addition, for these participants, a high-risk group was defined based on greater relative risk of negative consequences due to the extent of involvement with the risk behaviour. As detailed in the Methods section (see pp. 60 to 66), classifications were based on the relevant research literature. For several behaviors, however, there is little consensus as to what constitutes high-risk involvement. In such cases, the criteria were intended to capture a heightened level of risk exposure due to repeated involvement or a pattern of commitment to a given behaviour (Young et al., 2002; Zweig et al., 2001). Thus, for all ten risk behaviours three levels of involvement were

identified: no involvement, some involvement (at-risk), and high-risk/problematic involvement.

In addition, a separate set of analyses was conducted using a further refined levels of risk associated with gambling behaviour. Gambling was classified into four levels of risk (no involvement, low-risk, at-risk, high-risk/problematic) based on a combination of gambling frequency and the number of gambling consequences experienced (see p. 61 for a description of the levels). This refinement of the gambling categories for the other nine risk behaviours could not be created because no information about consequences related to each of the nine risk behaviours was available.

To examine the co-occurrence of gambling and other risk-taking behaviours, three analyses were conducted: correlations among risk behaviours, a count of the number of high risk behaviours reported by students in each gambling group, and cross-tabulation of level of risk for gambling and level of risk for the nine other risk behaviours.

Descriptive Analyses

The number of participants in each level of risk for the ten risk behaviours is presented in Table 39. Overall, the average involvement in each risk behaviour was low (see Table 40). One-way ANOVAs were conducted to examine the mean difference among the levels of risk. Mean differences were significant for all risk behaviours, smallest $F(3, 3763) = 993.39$, $p < .001$ for three levels of gambling risk, with the Bonferroni post hoc pair-wise comparison revealing significant differences

Table 39.

Percentage and Number of Participants (Shown in Parentheses) in Each Level of Risk for Ten Risk Behaviours

Risk Behaviour	Level of Risk			
	No-involvement	Low-risk	At-risk	High-risk
Gambling (4 groups)	38.2% (1438)	35.3% (1330)	18.3% (690)	8.2% (309)
Gambling (3 groups)	42.4% (1596)	--	39.6% (1491)	18.1% (680)
Direct Aggression	25.7% (969)	--	40.5% (1524)	33.8% (1274)
Minor Delinquency	48.1% (1813)	--	17.4% (655)	34.5% (1299)
Alcohol Use	18.8% (709)	--	47.4% (1786)	33.8% (1272)
Marijuana Use	60.3% (2270)	--	19.3% (728)	20.4% (769)
Indirect Aggression	65.2% (2457)	--	25.1% (945)	9.7% (365)
Sexual Activity	64.2% (2419)	--	23.5% (887)	12.2% (461)
Major Delinquency	91.0% (3429)	--	--	9.0% (338)
Hard Drug Use	81.8% (3080)	--	5.1% (193)	13.1% (494)
Smoking	80.4% (3028)	--	6.5% (246)	13.1% (493)

Note. N=3,767. Four gambling groups were created considering both gambling frequency and consequences. Three gambling groups also were created considering only gambling frequency (consistent with the other nine risk behaviours).

Table 40.

Means and Standard Deviations for Ten Risk Behaviour Measures by Level of Involvement

	Total		No involvement		Low-risk		Some involvement/ At-risk		High-risk/problematic	
Risk behaviours	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*
Alcohol	2.59	1.73	0.13	0.37	--	--	2.22	0.89	4.49	0.69
Smoking	1.03	1.68	0.33	0.54	--	--	2.00	0.04	4.89	1.14
Marijuana	2.08	1.57	1.00	0.00	--	--	2.63	0.80	4.73	0.81
Hard drugs	1.18	0.59	1.00	0.06	--	--	1.24	0.17	2.24	1.13
Sexual activity	2.30	1.55	1.44	0.77	--	--	3.45	1.38	4.62	1.01
Major delinquency	1.09	0.33	1.01	0.06	--	--	--	--	1.91	0.67
Minor delinquency	1.40	0.55	1.00	0.01	--	--	1.34	0.22	1.98	0.53
Direct aggression	1.73	0.83	1.00	0.01	--	--	1.49	0.26	2.59	0.85
Indirect aggression	1.21	0.46	1.01	0.05	--	--	1.34	0.16	2.21	0.89
Gambling 3 groups	1.22	0.38	1.00	0.00	--	--	1.21	0.15	1.74	0.61
Gambling 4 groups	1.22	0.38	1.00	0.00	1.23	0.21	1.30	0.30	1.96	0.77

Note. $N = 3{,}767$. Results are based on untransformed scores for each dependent measure. For each row variable, the means and SD's for each level of involvement apply only to that variable. For example, for alcohol use the 'no involvement' mean applies only to those classified as no involvement for alcohol; the smoking mean for 'at-risk' applies only to those classified as some involvement with smoking. Within a given row, differences between each pair of means are significantly different p's $< .001$ based on Bonferroni pair-wise comparisons. For smoking, 0 represents 'never smoked', and 1 represents 'no longer smoke' both of which were classified as 'no involvement'. For hard drugs, major delinquency, and indirect aggression, the data imputation produced continuous scores including some between the scale anchor points, thus, some participants classified as 'no involvement' had scores greater than 1.00. Sexual activity scores reflect a composite of three behaviors petting, oral sex, and sexual intercourse while the 'no involvement' classification was based on sexual intercourse only. Thus, some participants in the 'no involvement' group for sexual activity may have reported some level of petting or oral sex.

($p < .001$) among all pairs of means. The Bonferroni procedure was selected because it used a more conservative alpha level and allowed for *a priori* comparisons of all pairs (Howell, 2002). The conservative approach was consistent with the approach taken throughout this study.

Correlations

Correlations between the continuous measure of gambling and the continuous measures of the other nine risk behaviours ranged from .092 for smoking to .235 for direct aggression (see Table 41) indicting low relations. Even though the correlations were relatively small, using Bonferroni's correction to alpha, all correlations were significant at $p < .001$.

Number of Co-occurring High-Risk Behaviours

To examine the extent to which co-occurrence was present among each of the three categories of gambling risk, and each of the three risk categories for the other risk behaviours (e.g., alcohol, smoking, hard drug use), the number of risk behaviours reported at a 'high risk' level were counted (see Table 42 for a summary of results). For those who reported gambling at a 'high-risk' level ($n = 680$), the number of co-occurring behaviours reported at a 'high-risk' level ranged from zero to nine, with a median of two. Of the 1,491 'at-risk' gamblers, the number of reported co-occurring behaviours at a 'high-risk' level ranged from zero to nine, with a median of one. Of the 1,596 'no involvement' gamblers, the number reported co-occurring behaviours at a 'high risk' level ranged from zero to nine, with a median of one.

It is possible that the degree of co-occurrence would increase if a more refined examination of level of risk in gambling were undertaken. The four levels of

Table 41.

Correlations Among Continuous Measures of Gambling and Nine Risk Behaviours

Measure	1	2	3	4	5	6	7	8	9	10
1. Alcohol	--									
2. Smoking	.435	--								
3. Marijuana	.551	.559	--							
4. Hard drugs (t)	.325	.424	.592	--						
5. Sexual activity	.497	.410	.479	.343	--					
6. Minor delinquency	.397	.369	.499	.435	.356	--				
7. Major delinquency (t)	.197	.272	.272	.382	.222	.424	--			
8. Direct aggression	.235	.197	.249	.212	.194	.367	.327	--		
9. Indirect aggression (t)	.188	.173	.233	.208	.185	.358	.331	.595	--	
10. Gambling (t)	.176	.092	.117	.162	.231	.208	.209	.235	.231	--

Note. $N = 3{,}767$. t = correlations based on transformed scores. All correlations were significant at $p < .001$.

risk also were examined to determine if the relations among the other nine risk behaviours would change when the criteria for level of gambling risk included consideration of consequences (see pp. 62-66 for description of risk levels). Using the four gambling groups, the analyses were repeated. For those who reported gambling at a 'high risk' level (n = 309, 8.2%), the number of co-occurring behaviours reported at a 'high risk' level ranged from zero to nine, with a median of three. Of the 690 (18.3%) 'at-risk' gamblers, the number of reported co-occurring behaviours at a 'high-risk' level ranged from zero to nine, with a median of two. Of the 1,330 (35.3%) 'low-risk' gamblers, the number reported co-occurring behaviours at a 'high risk' level ranged from zero to eight, with a median of one. Of the 'no involvement' gamblers (n = 1,438, 38.2%), the number of 'high risk' behaviours engaged in by participants ranged from zero to eight with a median of one. It is important to note that the refinement of the gambling groups into four levels of risk highlights the fact that adding negative consequences associated with gambling to the classification of problem gambling appears to be effective in distinguishing those high-risk gamblers with the highest degree of co-occurrence with other risk behaviours. See Table 42 for a summary of the results.

Cross-Tabulation

Descriptive cross-tabulation analyses were conducted with the three levels of risk related to gambling (no involvement, at-risk, high-risk/problem) and each of the three levels of risk (no involvement, at-risk, high-risk) related to the other nine risk behaviours. See Table 43 for results of the cross-tabulation analyses. High risk gamblers were most frequently involved in "high" risk levels of direct aggression,

Table 42.

The Percentage of Participants in Each Gambling Group Reporting Co-occurring 'High Risk' Engagement in Nine Other Risk Behaviours

Gambling Group	*n*	Number of 'high risk' risk behaviours					
		0	1	2	3	4	5+
3 Groups							
High Risk	680	19.1%	21.2%	16.9%	12.8%	10.0%	19.9%
At-Risk	1491	30.2%	24.5%	17.4%	10.2%	7.0%	10.5%
No involvement	1596	38.9%	25.4%	13.8%	8.5%	5.5%	7.9%
4 Groups							
High Risk	309	11.7%	17.7%	15.2%	14.2%	15.5%	26.2%
At-Risk	690	20.7%	24.3%	19.0%	12.2%	8.7%	15.1%
Low-Risk	1330	32.6%	25.0%	16.8%	10.0%	5.9%	9.7%
No involvement	1438	41.0%	25.2%	13.4%	7.9%	5.2%	7.4%

Note. $N = 3,767$. Three gambling groups were categorized based on gambling frequency alone. Four gambling groups were categorized based on gambling frequency and number of gambling consequences experienced.

Table 43.

Percentage of Co-Occurring Risk Behaviours Within Each Level of Gambling Risk by Gender and Age, Using Three Gambling Groups

Behaviour	Model	Level of Gambling Risk											
		High Risk				At-Risk				No Involvement			
		N	% High	% At Risk	% None	*N*	% High	% At Risk	% None	*N*	% High	% At Risk	% None
Direct Aggression	Overall	680	48.5	34.7	16.8	1491	32.7	43.8	23.5	1596	28.6	39.8	31.6
	Male	465	57.0	32.3	10.8	658	43.9	41.3	14.7	599	39.4	36.9	23.7
	Female	215	30.2	40.0	29.8	883	23.9	45.7	30.4	977	22.1	41.5	36.4
	14	179	50.3	32.4	17.3	364	33.8	46.7	19.5	452	33.6	38.1	28.3
	15	132	49.2	39.4	11.4	260	37.7	41.5	20.8	280	32.5	39.3	28.2
	16	159	54.1	30.2	15.7	340	35.6	41.2	23.2	400	26.8	44.0	29.3
	17	103	45.6	41.7	12.6	244	29.5	45.9	24.6	264	26.1	35.2	38.6
	18	107	39.3	32.7	28.0	283	26.1	43.5	30.4	200	18.5	42.0	39.5
Minor Delinquency	Overall	680	46.3	20.0	33.7	1491	34.7	19.0	46.3	1596	29.3	14.8	56.0
	Male	465	49.2	18.7	32.0	658	38.8	19.5	41.8	599	30.6	16.0	53.4
	Female	215	40.0	22.8	37.2	883	31.5	18.6	49.9	977	28.5	14.0	57.5
	14	179	35.2	27.9	36.9	364	25.5	18.4	56.0	452	25.4	15.7	58.8
	15	132	50.0	18.2	31.8	260	33.1	20.0	45.9	280	27.9	13.9	58.2
	16	159	50.3	14.5	35.2	340	41.2	18.2	40.6	400	34.0	14.5	51.5
	17	103	54.4	14.6	31.1	244	39.3	19.7	41.0	264	31.8	14.8	53.4
	18	107	46.7	22.4	30.8	283	36.0	19.1	44.9	200	27.0	14.5	58.5
Alcohol Use	Overall	680	42.8	45.0	12.2	1491	36.0	47.1	16.8	1596	27.8	48.7	23.5
	Male	465	44.1	43.7	12.3	658	37.8	45.7	16.4	599	28.5	46.7	24.7
	Female	215	40.0	47.9	12.1	883	34.6	48.3	17.2	977	27.4	49.8	22.8
	14	179	20.1	59.2	20.7	364	14.3	58.0	27.7	452	12.8	54.9	32.3
	15	132	32.6	52.3	15.2	260	25.4	49.6	25.0	280	16.4	53.2	20.4
	16	159	52.8	36.5	10.7	340	46.5	42.9	10.6	400	39.0	43.0	18.0
	17	103	61.2	33.0	5.8	244	50.0	40.2	9.8	264	39.0	45.5	15.5
	18	107	60.7	36.4	2.8	283	49.1	42.0	8.8	200	40.5	44.0	15.5

Note. *N*'s: overall: 3,767, male: 1,722, female: 2,045, age 14: 995, age 15: 672, age 16: 899, age 17: 611, age 18: 590. To read results, the first column shows the number of high-risk gamblers within each gender and age. The next column shows the percentage of students reporting "high-risk" levels of a given problem behavior (shown by row). For example, of the 680 of students reporting "high-risk" levels of gambling, 48.5% also report "high" levels of direct aggression, 34.7% report "at-risk" levels of direct aggression, etc.

Table 43 Continued.

Percentage of Co-Occurring Risk Behaviours Within Each Level of Gambling Risk by Gender and Age, Using Three Gambling Groups

Behaviour	Model	Level of Gambling Risk: High Risk				At Risk				No Involvement			
		N	% High	% At Risk	% None	*N*	% High	% At Risk	% None	*N*	% High	% At Risk	% None
Marijuana Use	Overall	680	26.2	22.6	51.2	1491	20.5	19.3	60.2	1596	17.9	17.9	64.2
	Male	465	27.1	22.8	50.1	658	21.1	19.0	49.9	599	18.9	16.7	64.4
	Female	215	24.2	22.3	53.5	883	20.0	19.6	60.4	977	17.3	18.7	64.1
	14	179	20.1	14.3	62.6	364	12.1	12.9	75.0	452	13.1	15.0	71.9
	15	132	22.7	22.0	55.3	260	20.4	16.2	63.5	280	12.1	16.8	71.1
	16	159	31.4	21.4	47.2	340	23.5	24.1	52.4	400	23.8	19.3	57.0
	17	103	34.0	29.1	36.9	244	27.9	20.5	51.6	264	21.6	18.9	59.5
	18	107	25.2	28.0	46.7	283	21.6	23.7	54.8	200	20.0	22.0	58.0
Hard Drug Use	Overall	680	19.3	6.5	74.3	1491	13.4	4.2	82.4	1596	10.2	5.4	84.4
	Male	465	18.5	35.5	75.7	658	16.3	3.3	80.4	599	11.2	4.5	84.3
	Female	215	20.9	7.9	71.2	883	11.2	4.9	83.9	977	9.6	5.9	84.5
	14	179	15.1	7.8	77.1	364	7.1	2.2	90.7	452	6.9	4.2	88.9
	15	132	16.7	6.1	77.3	260	9.6	5.4	85.0	280	8.6	2.9	88.6
	16	159	21.4	5.7	73.0	340	18.5	4.4	77.1	400	14.8	7.5	77.8
	17	103	20.4	5.8	73.8	244	16.8	6.1	77.0	264	10.2	7.2	82.6
	18	107	25.2	6.5	68.2	283	15.9	3.9	80.2	200	11.0	5.0	84.0
Sexual Activity	Overall	680	19.1	29.3	51.6	1491	13.6	23.6	62.8	1596	8.0	21.1	70.9
	Male	465	18.7	29.7	51.6	658	12.3	23.7	64.0	599	6.2	19.0	74.8
	Female	215	20.0	28.4	51.6	883	14.6	23.5	61.8	977	9.1	22.3	68.6
	14	179	11.2	23.5	65.4	364	3.3	17.3	79.4	452	3.5	17.3	79.3
	15	132	15.9	22.7	61.4	260	6.9	20.4	72.7	280	4.3	16.1	79.6
	16	159	18.2	34.0	47.8	340	15.0	23.5	61.5	400	9.5	23.0	67.5
	17	103	29.1	35.9	35.0	244	16.8	31.6	51.6	264	12.5	22.7	64.8
	18	107	28.0	33.6	38.3	283	28.6	27.9	43.5	200	14.5	30.5	55.0

Note. *N*'s: overall: 3,767, male: 1,722, female: 2,045, age 14: 995, age 15: 672, age 16: 899, age 17: 611, age 18: 590. To read results, the first column shows the number of high-risk gamblers within each gender and age. The next column shows the percentage of students reporting "high-risk" levels of a given problem behavior (shown by row). For example, of the 680 of students reporting "high-risk" levels of gambling, 26.2% also report "high" levels of marijuana use, 22.6% report "at-risk" levels of marijuana use, etc.

Table 43 Continued.

Percentage of Co-Occurring Risk Behaviours Within Each Level of Gambling Risk by Gender and Age, Using Three Gambling Groups

Behaviour	Model	Level of Gambling Risk: High Risk				At-Risk				No Involvement			
		N	% High	% At Risk	% None	*N*	% High	% At Risk	% None	*N*	% High	% At Risk	% None
Smoking	Overall	680	18.8	5.7	75.4	1491	12.3	6.4	81.3	1596	11.3	7.0	81.6
	Male	465	16.6	4.5	78.9	658	10.8	6.4	82.8	599	10.2	4.7	85.1
	Female	215	23.7	8.4	67.9	883	13.6	6.4	80.1	977	12.0	8.4	79.5
	14	179	14.0	6.7	79.3	364	6.3	4.9	88.7	452	8.6	3.5	87.8
	15	132	15.9	3.8	80.3	260	9.6	6.2	84.2	280	8.9	6.1	85.0
	16	159	16.4	4.4	79.2	340	16.8	7.6	75.6	400	14.5	9.8	75.8
	17	103	34.0	3.9	62.1	244	15.6	6.1	78.3	264	13.3	6.4	80.3
	18	107	19.6	10.3	70.1	283	14.5	7.1	78.4	200	12.0	11.5	76.5
Indirect Aggression	Overall	680	18.4	25.6	56.0	1491	9.5	28.6	61.8	1596	6.1	21.6	72.3
	Male	465	22.8	24.3	52.9	658	13.5	58.6	57.9	599	8.8	19.9	71.3
	Female	215	8.8	28.4	62.8	883	6.4	28.7	64.9	977	4.5	22.6	72.9
	14	179	17.9	27.4	54.7	364	10.7	30.2	59.1	452	8.8	21.2	69.9
	15	132	17.4	26.5	56.1	260	13.5	28.1	58.5	280	6.1	25.0	68.9
	16	159	22.6	22.6	54.7	340	9.1	29.7	62.1	400	5.3	21.3	73.5
	17	103	17.5	25.2	57.3	244	8.2	26.2	65.6	264	4.9	18.2	76.9
	18	107	15.0	26.2	58.9	283	6.0	27.9	66.1	200	3.5	22.5	74.0
Major Delinquency	Overall	680	16.9	--	83.1	1491	7.8	--	92.2	1596	6.7	--	93.3
	Male	465	20.2	--	79.8	658	11.6	--	88.4	599	10.7	--	89.3
	Female	215	9.8	--	80.2	883	4.8	--	95.2	977	4.3	--	95.7
	14	179	16.8	--	83.2	364	6.3	--	93.7	452	7.7	--	92.3
	15	132	18.9	--	81.1	260	10.4	--	89.6	280	5.0	--	95.0
	16	159	18.2	--	81.8	340	9.1	--	90.9	400	8.0	--	92.0
	17	103	17.5	--	82.5	244	9.4	--	90.6	264	6.1	--	93.9
	18	107	12.1	--	87.9	283	4.2	--	95.8	200	5.0	--	95.0

Note. *N*'s: overall: 3,767, male: 1,722, female: 2,045, age 14: 995, age 15: 672, age 16: 899, age 17: 611, age 18: 590. To read results, the first column shows the number of high-risk gamblers within each gender and age. The next column shows the percentage of students reporting "high-risk" levels of a given problem behavior (shown by row). For example, of the 680 of students reporting "high risk" levels of gambling, 18.8% also report "high" levels of smoking, 5.7% report "at-risk" levels of smoking, etc.

minor delinquency, and alcohol use (48.5%, 46.3%, and 42.8% respectively). The "at-risk" gamblers most frequently reported "high" risk levels of alcohol, minor delinquency and direct aggression (36.0%, 34.7%, and 32.7% respectively). Overall, participation in "high" levels of each of the nine risk behaviours increased with greater level of risk associated with gambling.

The same three risk behaviours (direct aggression, minor delinquency, and alcohol) also were the most frequently co-occurring behaviours with high-risk/problematic gambling across models for age and gender (see Table 43). Descriptively, the greatest age difference in co-occurrence between high-risk/problem gambling and other high-risk behaviours was with alcohol use (e.g., 14 year olds reported 20% co-occurrence between alcohol and gambling while 18 year olds reported 61% co-occurrence). This finding is not surprising given that alcohol use descriptively had the largest age difference; that is, the mean for alcohol use across all groups was 1.83 and 3.21 for 14 and 18 year olds respectively, while the mean for gambling was 1.23 and 1.22 for 14 and 18 year olds respectively. In addition, descriptively the largest gender difference (male > female) in co-occurrence among high-risk/problematic gambling and high-risk behaviours was found with direct aggression. Males were involved in these risk behaviours more than females (direct aggression: 2.03, 1.48; gambling: 1.32, 1.14 for males and females respectively). See Table 44 for means and standard deviations for all risk behaviours.

The data also were examined using the same four levels of risk (no involvement, low-risk, at-risk, high-risk/problem) used in the discriminant function analysis. The four levels of risk were examined to determine if the relations among

Table 44.

Means and Standard Deviations for Ten Risk Behaviour Measures by Gender and Age

	Male		Female		14		15		16		17		18	
Risk behaviours	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*	Mean	*SD*
Alcohol	2.70	1.82	2.50	1.64	1.83	1.55	2.17	1.67	2.99	1.70	3.12	1.66	3.21	1.55
Smoking	0.97	1.66	1.08	1.69	0.69	1.33	0.87	1.58	1.21	1.79	1.34	1.92	1.21	1.76
Marijuana	2.17	1.66	2.00	1.48	1.71	1.36	1.93	1.52	2.31	1.66	2.35	1.65	2.23	1.59
Hard drugs	1.21	0.64	1.16	0.53	1.15	0.61	1.16	0.56	1.21	0.61	1.20	0.61	1.18	0.50
Sexual activity	2.35	1.59	2.26	1.51	1.78	1.30	1.94	1.38	2.46	1.56	2.65	1.64	2.97	1.62
Major delinquency	1.15	0.43	1.04	0.20	1.09	0.34	1.09	0.33	1.09	0.32	1.10	0.36	1.07	0.32
Minor delinquency	1.47	0.60	1.34	0.49	1.35	0.55	1.42	0.59	1.45	0.57	1.42	0.52	1.35	0.45
Direct aggression	2.03	0.95	1.48	0.60	1.79	0.84	1.48	0.81	1.77	0.87	1.69	0.83	1.57	0.73
Indirect aggression	1.29	0.59	1.14	0.30	1.23	0.49	1.24	0.49	1.21	0.46	1.17	0.46	1.16	0.35
Gambling	1.32	0.51	1.14	0.23	1.23	0.46	1.23	0.41	1.20	0.37	1.21	0.37	1.22	0.31

Note. $N = 3{,}767$. Results are based on untransformed scores for each dependent measure. For smoking, 0 represents 'never smoked', and 1 represents 'no longer smoke'.

the other nine risk behaviours would change if the criteria for level of gambling risk included consideration of consequences (see p. 61 for description of risk levels). Overall, the pattern of 'high-risk' level co-occurrence remained the same. In addition, the three most frequently reported co-occurring risk behaviours remained direct aggression, minor delinquency and alcohol use (58.9%, 56.3% and 46.6% respectively). See Table 45 for summary of results.

Table 45.

Percentage of Co-Occurring Risk Behaviours Within Each Level of Gambling Risk by Gender and Age, Using Four Gambling Groups

Behaviour		Level of Gambling Risk															
		High Risk				At-Risk				Low-Risk				No Involvement			
		N	% High	% At Risk	% None	*N*	% High	% At Risk	% None	*N*	% High	% At Risk	% None	*N*	% High	% At Risk	% None
Direct Aggression	Overall	309	58.9	29.8	11.3	690	41.2	42.2	16.7	1330	31.4	42.8	25.9	1438	27.2	39.8	33.0
	Male	242	62.4	28.5	9.0	370	52.2	35.9	11.9	589	41.4	42.1	16.5	521	38.8	37.0	24.2
	Female	67	46.3	34.3	19.4	320	28.4	49.4	22.2	741	23.3	43.3	33.3	917	20.6	41.3	38.1
	14	85	57.6	32.9	9.4	161	44.7	39.8	15.5	343	33.2	44.6	22.2	406	32.0	38.2	29.8
	15	52	57.7	25.0	17.3	112	43.8	46.4	9.8	253	37.5	42.3	20.2	255	31.4	38.4	30.2
	16	80	67.5	25.0	7.5	178	38.8	42.1	19.1	281	34.2	39.5	26.3	360	26.4	43.9	29.7
	17	46	58.7	34.8	6.5	118	41.5	43.2	15.3	215	27.0	45.6	27.4	232	23.3	35.8	40.9
	18	46	47.8	32.6	19.6	121	37.2	40.5	22.3	238	22.7	42.0	35.3	185	17.3	42.2	40.5
Minor Delinquency	Overall	309	56.3	22.3	21.4	690	42.2	19.0	38.8	1330	32.6	18.6	48.7	1438	27.8	14.4	57.8
	Male	242	57.9	21.5	20.7	370	45.4	18.6	35.9	589	35.8	18.2	46.0	521	28.4	15.9	55.7
	Female	67	50.7	25.4	23.9	320	38.4	19.4	42.2	741	30.1	19.0	50.9	917	27.5	13.5	59.0
	14	85	44.7	30.6	24.7	161	38.5	15.5	46.0	343	22.4	21.6	56.0	406	23.2	15.5	61.3
	15	52	55.8	13.5	30.8	112	41.1	24.1	34.8	253	34.0	17.8	48.2	255	27.1	14.1	58.8
	16	80	62.5	17.5	20.0	178	47.2	14.0	38.8	281	36.7	18.9	44.5	360	33.1	14.2	52.8
	17	46	58.7	26.1	15.2	118	45.8	21.2	33.1	215	38.6	16.3	45.1	232	31.0	12.9	56.0
	18	46	65.2	21.7	13.0	121	37.2	24.0	38.8	238	35.7	17.2	47.1	185	24.9	14.6	60.5
Alcohol Use	Overall	309	46.6	45.3	8.1	690	43.6	44.8	11.6	1330	33.4	48.0	18.6	1438	26.6	48.6	24.8
	Male	242	47.5	44.6	7.9	370	45.1	44.3	10.5	589	34.3	46.0	19.7	521	27.1	46.3	26.7
	Female	67	43.3	47.8	9.0	320	41.9	45.3	12.8	741	32.7	49.5	17.8	917	26.4	49.9	23.7
	14	85	27.1	56.5	16.5	161	20.5	58.4	21.1	343	11.4	60.1	28.6	406	13.6	53.4	34.0
	15	52	28.8	57.8	13.5	112	27.7	58.9	13.4	253	26.5	47.0	26.5	255	16.5	51.8	31.8
	16	80	65.0	32.5	2.5	178	51.1	39.9	9.0	281	43.1	43.1	13.9	360	37.2	43.9	18.9
	17	46	63.0	34.8	2.2	118	62.7	29.7	7.6	215	47.4	42.3	10.2	232	35.8	47.4	16.8
	18	46	54.3	43.5	2.2	121	59.5	35.5	5.0	238	48.3	42.4	9.2	185	39.5	44.3	16.2

Note. *N*'s: overall: 3,767, male: 1,722, female: 2,045, age 14: 995, age 15: 672, age 16: 899, age 17: 611, age 18: 590. To read results, the first column shows the number of high-risk gamblers within each gender and age. The next column shows the percentage of students reporting "high-risk" levels of a given problem behavior (shown by row). For example, of the 680 of students reporting "high-risk" levels of gambling, 8.9% also report "high" levels of direct aggression, 29.8% report "at-risk" levels of direct aggression, etc.

Table 45 Continued.

Percentage of Co-Occurring Risk Behaviours Within Each Level of Gambling Risk by Gender and Age, Using Four Gambling Groups

Behaviour		Level of Gambling Risk															
		High Risk				At-Risk				Low-Risk				No Involvement			
		N	% High	% At Risk	% None	*N*	% High	% At Risk	% None	*N*	% High	% At Risk	% None	*N*	% High	% At Risk	% None
Marijuana Use	Overall	309	30.7	22.0	47.2	690	25.5	23.5	51.0	1330	19.1	18.9	62.0	1438	17.0	17.1	65.9
	Male	242	30.2	23.6	46.3	370	27.0	23.2	49.7	589	19.4	18.3	62.3	521	17.5	15.4	67.2
	Female	67	32.8	16.4	50.7	320	23.8	23.8	52.5	741	18.9	19.4	61.7	917	16.7	18.1	65.2
	14	85	27.1	14.1	58.8	161	19.9	14.9	65.2	343	10.8	14.0	75.2	406	11.6	15.3	73.2
	15	52	21.2	15.4	63.5	112	21.4	21.4	57.1	253	20.9	17.4	61.7	255	11.4	16.5	72.2
	16	80	40.0	28.8	31.3	178	32.0	22.5	45.5	281	19.6	23.1	57.3	360	22.5	18.1	59.4
	17	46	39.1	32.6	28.3	118	28.8	31.4	40.7	215	27.4	17.2	55.3	232	21.6	17.7	60.8
	18	46	23.9	21.7	54.3	121	24.8	30.6	44.6	238	21.0	24.4	54.6	185	20.0	19.5	60.5
Hard Drug Use	Overall	309	23.3	55.5	71.2	690	18.4	6.5	75.1	1330	12.0	4.4	83.5	1438	9.4	5.0	85.6
	Male	242	22.3	4.5	73.1	370	19.5	5.7	74.9	589	13.8	3.7	82.5	521	10.2	4.2	85.6
	Female	67	26.9	9.0	64.2	320	17.2	7.5	75.3	741	10.7	5.0	84.3	917	8.9	5.5	85.6
	14	85	22.4	6.2	69.4	161	12.4	3.7	83.9	343	6.4	2.9	90.7	406	5.7	4.4	89.9
	15	52	13.5	5.8	80.8	112	14.3	7.1	78.6	253	10.7	5.1	84.2	255	8.2	2.4	89.4
	16	80	27.5	3.8	68.8	178	25.3	5.6	69.1	281	14.2	5.7	80.1	360	13.6	6.9	79.4
	17	46	26.1	2.2	71.7	118	17.8	11.0	71.2	215	15.3	5.6	79.1	232	9.9	6.0	84.1
	18	46	26.1	6.5	67.4	121	20.7	6.6	72.7	238	16.0	3.4	80.7	185	10.3	4.9	84.9
Sexual Activity	Overall	309	27.5	28.8	43.7	690	14.3	26.8	58.8	1330	12.5	22.9	64.7	1438	7.7	21.5	70.8
	Male	242	27.7	28.5	43.8	370	11.1	27.6	61.4	589	11.4	22.6	66.0	521	5.8	20.0	74.3
	Female	67	26.9	29.9	43.3	320	18.1	25.9	55.9	741	13.4	23.1	63.6	917	8.8	22.4	68.8
	14	85	21.2	25.9	52.9	161	3.7	20.5	75.8	343	3.5	15.7	80.8	406	3.0	18.2	78.8
	15	52	26.3	21.2	51.9	112	7.1	20.5	72.3	253	7.1	19.8	73.1	255	4.3	17.3	78.4
	16	80	26.3	33.8	40.0	178	12.4	32.6	55.1	281	14.2	22.1	63.7	360	9.7	21.9	68.3
	17	46	32.6	34.8	32.6	118	25.4	32.2	42.4	215	14.9	30.2	54.9	232	11.6	23.7	64.7
	18	46	37.0	28.3	34.8	121	27.3	27.3	45.5	238	26.9	30.7	42.4	185	14.1	30.8	55.1

Note. *N*'s: overall: 3,767, male: 1,722, female: 2,045, age 14: 995, age 15: 672, age 16: 899, age 17: 611, age 18: 590. To read results, the first column shows the number of high-risk gamblers within each gender and age. The next column shows the percentage of students reporting "high-risk" levels of a given problem behavior (shown by row). For example, of the 680 of students reporting "high-risk" levels of gambling, 30.7% also report "high" levels of marijuana use, 22.0% report "at-risk" levels of marijuana use, etc.

Table 45 Continued.

Percentage of Co-Occurring Risk Behaviours Within Each Level of Gambling Risk by Gender and Age, Using Four Gambling Groups

Behaviour		Level of Gambling Risk															
		High Risk				At-Risk				Low-Risk				No Involvement			
		N	% High	% At Risk	% None	*N*	% High	% At Risk	% None	*N*	% High	% At Risk	% None	*N*	% High	% At Risk	% None
Smoking	Overall	309	20.4	5.8	73.8	690	15.2	6.5	75.1	1330	12.0	4.4	83.5	1438	9.4	5.0	85.6
	Male	242	17.8	5.8	76.4	370	12.4	5.7	74.9	589	13.8	3.7	82.5	521	10.2	4.2	85.6
	Female	67	29.9	6.0	64.2	320	18.4	7.5	75.3	741	10.7	5.0	84.3	917	8.9	5.5	85.6
	14	85	18.8	10.6	70.6	161	9.9	3.7	83.9	343	6.4	2.9	90.7	406	5.7	4.4	89.9
	15	52	17.3	3.8	78.8	112	6.3	7.1	78.6	253	10.7	5.1	84.2	255	8.2	2.4	89.4
	16	80	18.8	3.8	77.5	178	19.7	5.6	69.1	281	14.2	5.7	80.1	360	13.6	6.9	79.4
	17	46	37.0	2.2	60.9	118	19.5	11.0	71.2	215	15.3	5.6	79.1	232	9.9	6.0	84.1
	18	46	13.0	6.5	80.4	121	19.8	6.6	72.7	238	16.0	3.4	80.7	185	10.3	4.9	84.9
Indirect Aggression	Overall	309	27.5	26.9	45.6	690	12.6	30.9	56.5	1330	8.9	26.2	64.9	1438	5.2	20.9	73.9
	Male	242	29.8	27.7	42.6	370	15.9	29.7	54.3	589	12.7	24.1	63.2	521	8.1	19.4	72.6
	Female	67	19.4	23.9	56.7	320	8.8	32.2	59.1	741	5.8	27.9	66.3	917	3.6	21.7	74.7
	14	85	22.4	27.1	50.6	161	18.0	28.0	54.0	343	9.6	29.2	61.2	406	7.4	21.4	71.2
	15	52	34.6	17.3	48.1	112	12.5	36.6	50.9	253	12.3	26.1	61.7	255	4.7	24.3	71.0
	16	80	31.3	30.3	38.8	178	10.1	31.5	58.4	281	9.3	25.6	65.1	360	5.3	19.4	75.3
	17	46	26.1	30.4	43.5	118	13.6	25.4	61.0	215	7.0	23.7	69.3	232	3.4	18.5	78.0
	18	46	23.9	28.3	42.8	121	8.3	33.9	57.9	238	5.5	25.2	69.3	185	3.2	20.5	76.2
Major Delinquency	Overall	309	25.2	--	74.8	690	10.7	--	89.3	1330	7.3	--	92.7	1438	6.2	--	93.8
	Male	242	28.1	--	71.9	370	12.4	--	87.6	589	10.9	--	89.1	521	10.7	--	89.3
	Female	67	14.9	--	85.1	320	8.8	--	91.3	741	4.5	--	95.5	917	3.6	--	96.4
	14	85	23.5	--	76.5	161	9.3	--	90.7	343	6.4	--	93.6	406	7.6	--	92.4
	15	52	32.7	--	67.3	112	9.8	--	90.2	253	10.7	--	89.3	255	4.3	--	95.7
	16	80	30.0	--	70.0	178	10.7	--	89.9	281	7.8	--	92.2	360	7.5	--	92.5
	17	46	17.4	--	82.6	118	16.1	--	83.9	215	8.4	--	91.6	232	5.2	--	94.8
	18	46	19.6	--	80.4	121	8.3	--	91.7	238	3.4	--	96.6	185	4.3	--	95.7

Note. *N*'s: overall: 3,767, male: 1,722, female: 2,045, age 14: 995, age 15: 672, age 16: 899, age 17: 611, age 18: 590. To read results, the first column shows the number of high-risk gamblers within each gender and age. The next column shows the percentage students reporting "high-risk" levels of a given problem behavior (shown by row). For example, of the 680 of students reporting "high-risk" levels of gambling, 20.4% also report "high" levels of smoking, 5.8% report "at-risk" levels of smoking, etc.

DISCUSSION

The purpose of this study was: a) to examine the prevalence and consequences associated with adolescent gambling; b) to examine the factors which influence adolescent gambling; c) to determine what factors discriminate among four groups of gamblers (no-risk/non-gamblers, low-risk gamblers, at-risk gamblers, and high-risk/problematic gamblers); and, d) to examine the relation of gambling to other risk behaviours. The discussion addresses each of these results in turn.

Prevalence of Adolescent Gambling Behaviour and Gambling Consequences

Compared with prevalence rates reported in past research studies (Derevensky & Gupta, 2000a; Govoni, Rupcich, & Frisch, 1996; Gupta & Derevensky, 2001; Gupta & Derevensky, 1997; Winters et al., 1993), slightly fewer adolescents reported gambling in this sample compared to adolescents in past research (62% vs. between 71% and 86%) and almost one quarter of the sample (n = 22.6%) reported experiencing at least one gambling consequence in the past year. The measurement of the frequency of participation in gambling activities in this study, however, varied from the literature. Past research typically has asked participants about their gambling behaviour in the past year (e.g., Derevensky & Gupta, 2000; Govoni, Rupcich, & Frisch, 1996; Gupta & Derevensky, 1997; Poulin, 2002). In contrast, in the present study participants were asked about their gambling behaviour in the past month. Given that the overall gambling participation rates were slightly lower in this sample than those found in the literature, it may be that the lower rates of gambling were due to the shorter measurement time frame.

Overall, participation in gambling activities was low for this sample with adolescents reporting an average frequency of gambling activity between never and once or twice in the past month. Within this sample, however, slightly less than one-third of adolescents reported gambling at least weekly on at least one of the eight gambling activities. This percentage is consistent with past research that found between 15% to 35% of adolescents reported gambling weekly (Deverensky & Gupta, 2000; Gupta & Deverensky, 1998a; Winters et al., 1993b).

The majority of adolescents, therefore, appear to engage in some gambling activities but the frequency of gambling is not high. The prevalence of gambling is most likely linked to an individual's definition of gambling. For example, if adolescents do not perceive playing cards or buying lottery tickets as forms of gambling, their participation in these activities may be under-reported. These activities likely are accepted by many as recreational, socially-accepted, and engaged in for charitable purposes. For example, draws often are used as a fundraising activity by schools and churches. Opportunities for participation in these activities, therefore, are common and may not have any social implications for participation if they are not considered to be gambling. In fact, playing cards for money, buying lottery tickets, and entering draws were the most commonly reported activities in this study – these activities may not be considered by adolescents to be *gambling* to the same extent as going to the casino or bingo.

To offset that concern, the gambling questions in this study were not explicitly identified to participants as *gambling* activities. However, it may be that the adolescents determined that the questions were about gambling behaviour, given the

general focus of the survey was on risk behaviors, and hence, under-reported their involvement in the gambling activities. It may be necessary for researchers to provide a definition of gambling to participants in future studies to address that issue. It is not clear whether a standardized definition of gambling was provided to participants in previous gambling studies. Having a definition of what constitutes gambling behaviour for each study would provide consistency for adolescents' interpretation of gambling activities, and would reduce the potential for a systematic bias toward under-reporting of gambling behaviour. It is not clear, however, that under-reporting was an issue in this study. It is very likely that adolescents just may gamble infrequently.

Gender Differences

Consistent with past research, males reported gambling and experiencing consequences from gambling more often than females (see Abbott & Cramer, 1993; Carlson & Moore, 1998; Derevensky & Gupta, 2000). This gender difference also is consistently found with other risk behaviours such as delinquency and alcohol use (Griffin, Botvin, Scheier, Doyle & Williams, 2003). In this sample, males and females did not differ with respect to their preference for participation in specific gambling activities. It appears, therefore, that males and females engage in the same activities, but males just are involved at a higher frequency.

It is not clear why these gender differences consistently are found. Wolfgang (1988) suggested that gambling involvement may be influenced by sex-role socialization. She suggested that sex-role socialization contributes to opportunities, motives, and the development of skills, all of which influence both interest and

participation in gambling activities. For example, males may be socialized more than females to be risk takers. Griffiths (1989) hypothesized that for males, the social environment of gambling allows them opportunities to test their courage (e.g., when taking risks to win), an important social trait in adulthood, and may explain the higher rates of gambling among males as compared to females. In addition, one motive for gambling participation by males may be that gambling participation allows them to demonstrate greater maturity status (see Moffitt, 1993 for a discussion of delinquency and males). Further, males and females may be attracted to different types of leisure activities with females being less attracted to gambling activities. In support of this hypothesis, Zenker and Wolfgang (1982) studied gender preference for leisure activities and found that males preferred gambling activities while females preferred games that used verbal skill.

Age Differences

The present study demonstrated that the overall frequency of adolescents' gambling did not differ by age. Researchers have found mixed support for age-related differences in frequency of gambling behaviours among adolescent gamblers. For example, Gupta and Derevensky (1998b) found a small increase in gambling participation across grade 7, 9, and 11 students with grade 11 students reporting the most frequent gambling. The Canadian Foundation on Compulsive Gambling (1994) also found that older adolescents reported some gambling problems at a greater rate than younger students. On the other hand, Poulin (2000) found no age-related differences in the frequency of gambling participation among secondary school students. This finding is in contrast to other normative adolescent risk behaviours

(e.g., alcohol use, marijuana use) where the frequency rate is higher with older adolescents (Adlaf, Paglia, & Ivis, 1999).

An examination of the frequency of participation in specific gambling activities also revealed few age differences, with the only finding being that 18 year olds were more likely to go to the casino and buy lottery tickets than adolescents aged 17 years or younger. At the age of 18, adolescents are legally able to purchase lottery tickets and at age 19, adolescents are legally able to enter a casino. The upper limit for the measure of age used in this study was "18 or older" and did not allow for a differentiation between those adolescents aged 18 and those adolescents aged 19 years. Therefore, some adolescents within the age 18 categorization may in fact have been 19 years of age. The higher incidence of attendance at the casino and purchase of lottery tickets for the students aged 18 or older may be due to the accessibility of these activities for this age group.

A significant age effect for the gambling consequence of *spending more than they wanted to* was found, with older adolescents reporting more frequently experiencing the consequence than younger adolescents. The experience of this consequence does not appear to be related to gambling activities in general but may be due to the corresponding age-related increase in participation in gambling activities which require more money for participation (e.g., going to the casino).

Predictors of Adolescent Gambling Involvement

This study was the first to include a comprehensive set of predictors drawn from the neighbourhood, school, family, intrapersonal, and peer domains. Overall, the 21 predictors only accounted for 15.2% of the variance in gambling behaviour (i.e.,

using a composite measure of frequency of involvement in eight gambling activities). The small amount of variance accounted for may be a result of several factors. First, the variability in gambling activity was low, thereby affecting the power to detect noteworthy predictors. Second, the 21 predictors may truly only account for a limited amount of variance in gambling involvement, suggesting that this study did not include some potentially important predictors of gambling behaviour such as parental gambling behaviour, participants' attitudes specifically towards gambling, coping with daily hassles, age of onset of gambling, societal acceptance of gambling, among others. Third, measurement error may have contributed to the low correlations with gambling, although this issue is less likely given the good reliability of the measures and the fact that they were based on established scales.

Overall, the most consistent noteworthy predictors of gambling behaviour across all models in the regression analyses were gender (males >females), more frequent involvement in unstructured activities, more frequent involvement in structured activities, poorer well-being, better quality parental relationship, and perception of greater sibling involvement in risk behaviours. Although gender, the strongest predictor, was not a noteworthy predictor for the older adolescents, the finding that males report more gambling than females is consistently found within the literature (e.g., Govini, Rupcich & Frisch, 1996; Derevensky & Gupta, 2001, 1998b). For older adolescents, it could be that because they now are legally able to purchase lottery tickets and go to the casino, females may increase their participation in these activities as they reach legal age.

Unstructured and structured activities may provide opportunities for gambling, and participation in these activities may reflect the social nature of some gambling activities. In fact, these activities may facilitate associations with peers who gamble, thus placing adolescents at a greater risk for gambling participation. For example, participation in community sports may provide greater opportunity for gambling participation given that betting on sports was an activity frequently reported in this sample. Alternatively, adolescents may seek out activities and peers who support their gambling behaviour.

In addition, social learning theorists such as Bandura (1977) suggest that modeling risk behaviours may promote risk-taking behaviour by others, particularly if the modeling is done by a person with special meaning (e.g., parent, peer, sibling). This hypothesis was supported in this study in that the perception that siblings are more engaged in risk behaviours was a noteworthy predictor of involvement in gambling activities. The perception of involvement in risk behaviours by siblings may normalize participation in gambling.

A small amount of statistical suppression was found with the parental relationship and well-being predictors. Given this finding, the reliability of these results is uncertain and caution must be used when interpreting these findings. The complex inter-relation among the predictors (e.g., temperament, parental monitoring) and both parental relationships and well-being may account for the suppression. Alternatively, a better quality parental relationship may suggest that gambling occurs as part of family activities. In support of this suggestion, past research has found that adolescent gambling frequently takes place with family members (Gupta &

Derevensky, 1997; Moore & Ohtsuka, 1997; Winters, Stinchfield, & Kim, 1995). Parental relationship was a noteworthy predictor in this sample, however, for younger adolescents only. It may be that parental relationships play a less direct role than peers in predicting risk behaviours with older adolescents (see Larson & Richards, 1991). Some support for this hypothesis was found in this study, with unstructured activities (exclusively peer-related activities) predicting gambling behaviour with older adolescents and parental relationships predicting gambling behaviour with younger adolescents.

One aspect of well-being, depression, has been found in past studies to be related to gambling involvement (Gupta & Derevensky, 1998a, 1998b). Caffray and Schneider (2000) found affective state to be a motivator for avoidance behaviour and increased risk-taking by having a goal of coping with unpleasant feelings. Further, Caffray and Schneider suggest that affect regulation is instrumental in adolescents' decisions to participate in risk behaviours and therefore, may provide a rationale for the differentiation between at-risk and problem gamblers. Alternatively, the more negative affective states may be a result of the gambling behaviour. The present study can not distinguish between cause and effect and given the existence of suppression for both parental relationship and well-being, it will be important to replicate this study before drawing any conclusions.

It was expected that risk attitudes/perceptions would be a noteworthy predictor given past research examining the role of attitudes and perceptions on behaviour, including problem behaviour theory (Jessor & Jessor, 1977), theories of reasoned action (Ajzen & Fishbein, 1980) and planned behaviour (Ajzen, 1988), and

Triadic Influence Theory (Flay & Petraitis, 1994). These theories suggest that proximal factors such as perceptions and attitudes are the strongest predictors of behaviour. In addition, the correlation between risk attitudes and gambling behaviour was the highest found between the predictors and gambling behaviour across all models. In the regression analysis, however, risk attitudes/perceptions was a noteworthy predictor in the context of all 21 predictors only for females. It may be that the moderate correlations between risk attitudes/perceptions and the other 20 predictors affected the impact of risk attitudes/perceptions on gambling when all the 21 predictors were simultaneously entered into the analyses.

The majority of the 21 predictors in this study, therefore, were not noteworthy direct predictors of gambling in the context of all the predictors. The lack of direct effects on gambling behaviour, however, does not indicate a lack of importance. These variables may have important indirect effects on gambling behaviour. In fact, Flay and Petraitis (1994; Petraitis et al., 1998) argue that for more distal variables such as parental monitoring, the impact on behaviour may be indirect through proximal variables such as perceptions and attitudes. The organization of the TTI specifically suggests a possible direction for the direct and indirect 'flow' of effects among the levels of influence, from ultimate-level variables through distal-level predictors, through proximal-level risk attitudes/perceptions to each risk behavior (Petraitis et al., 1998). Proximal variables, therefore, are expected to have direct effects on risk behaviors. In contrast, the effects of ultimate and distal variables are expected to work through the proximal variables (Petraitis et al., 1998). As suggested by Flay and Petraitis (1994), ultimate-level variables are expected to have multiple

indirect effects through distal and proximal variables. For example, if the main contribution of temperament is indirect, then its contribution to the prediction of risk behaviors would not be detected when only direct effects are estimated. Thus, through the inclusion of indirect and/or mediated pathways, detection of ultimate- or distal-level effects may be more likely than the detection of simple associations, especially since the detection of indirect effects does not require that there be a simple association between the ultimate- or distal-level variables and the risk behavior (Shrout & Bolger, 2002). Importantly, the hypothesized 'flow' of effects in TTI does not negate the possibility of bi-directional relations as well as interactions within and among levels of predictors. Specifically separating predictors into ultimate, distal, and proximal levels of influence, and examining the direct and indirect effects of these predictors on gambling behaviour is warranted.

There was only one notable predictor (participation in unstructured activities) in the models for 17 and 18 year olds. As unstructured activities involve peer activities (e.g., hanging out with friends, going to parties), this finding highlights again the importance of peers in predicting gambling involvement with older adolescents (in contrast to parental relationships with younger adolescents). Older adolescents have more unsupervised time with peers (Borawski, Ievers-Landis, Lovegreen, & Trapl, 2003) where opportunities for gambling may be more available. In fact, this hypothesis could be supported in future studies by specifically examining whether older adolescents engage in gambling activities with peers more often than younger adolescents.

Discriminating Among Groups of Adolescent Gamblers

Gambling Activities and Consequences as a Function of Gambling Group

Overall, the percentage of high-risk/problem gamblers in this study (8.2%) was consistent with proportions reported in the literature (between 3.4 and 8.7%, Gupta & Derevensky, 1996, 2001). Also consistent with past research, males were more likely than females to be categorized as problem gamblers (e.g., Gupta & Derevensky, 1997; Poulin, 2002). In this study, 14% of males as opposed to 3% of females were classified as problem gamblers, consistent with the earlier finding of gender differences in both overall prevalence and frequency rates. It is not clear why there are consistent gender differences. Do females engage in different gambling activities from those that were included in this research; are females' views of gambling different from males; or is it that females are less susceptible than males to becoming problem gamblers? Alternatively, if females just gamble less than males, what explains the difference in degree of gambling involvement? These questions need to be addressed in future studies in order to understand the gender difference consistently found in research.

Interestingly, the percentage of problem gamblers was consistent across all age groups, suggesting that participation in high-risk/problem gambling activities begins earlier than high school and that, by the time adolescents enter grade nine, a sub-group of adolescents is already gambling at problematic levels. The suggestion that gambling involvement begins prior to high school is supported by past research that has shown that the average age of first gambling experience was 11.5 year (Gupta & Derevensky, 1998b). As indicated in other studies (see Carlson & Moore,

1998), this finding of similar rates of high-risk/problem gambling with 14 year olds as with 18 year olds, would support the need for gambling education and early intervention programs during elementary school. Alternatively, it may be that when some adolescents are exposed to gambling, they begin gambling at a problematic level. Early participation in gambling may be a result of social acceptance or increasing availability and accessibility in society (Hardoon & Derevensky, 2002). Longitudinal studies are therefore required to determine the development of gambling problems among adolescents.

The percentage of adolescents reporting no involvement with gambling differed across age with fewer older adolescents than younger adolescents reporting never gambling. This increase in the number of gamblers among older adolescents is consistent with past research (Gupta & Derevensky, 1998a; Stinchfield, 2000) and may be due to increased opportunities to "hang out" with peers (i.e., unstructured activities) and to participate in previously regulated forms of gambling (e.g., buying lottery tickets, going to the casino).

High-risk/problem gamblers reported greater participation in all gambling activities and also reported experiencing more gambling consequences than other gamblers. These findings suggest that it is neither a specific gambling activity nor a specific gambling consequence that differentiates high-risk/problem gamblers from other gamblers. Rather, what appears to distinguish the high-risk/problem gamblers from other gamblers is frequency of participation.

Factors that Discriminate Among Groups of Gamblers

Discriminant function analyses were conducted to determine whether the four groups of gamblers could be differentiated on the basis of 21 variables from five domains (neighbourhood, school, family, peer, and intrapersonal). Analyses revealed that almost 18% of the variance in gambling group separation was accounted for by the 21 predictors. The overall model with all participants included and the models for each gender had two significant functions whereas the models for each age cohort each only had one significant function. For each model, the first function accounted for between 64% and 86% of the explainable variance. The second function on the overall model and the models for gender accounted for a small amount of the remaining variance, only between 11% and 17%. Consistently across all models, the first function separated the four groups of gamblers - non-gamblers, low-risk gamblers, at-risk gamblers, and high-risk/problem gamblers.

While noteworthy predictors within the first function varied across models, the top predictors remained consistent, with risk attitudes/perceptions, participation in unstructured activities, and gender being the best discriminating variables among the four groups. Across age, there were noteworthy discriminating variables beyond participation in unstructured activities, risk attitudes/perceptions, and gender but few consistent patterns. The lack of consistent patterns may be a result of small cell sizes, particularly with the high-risk/problem gambling group.

The first function was followed-up with ANOVAs and Tukey pairwise comparisons. For the most part, the discrimination among the four gambling groups was monotonic with the high-risk/problem gamblers reporting poorer outcomes on

each noteworthy variable and the non-gamblers reporting more positive outcomes. Thus, the individual discriminating variables replicated the centroid results of the overall function. It is important to note, however, that these group differences were not large.

The second function in both the overall model and the models for both genders separated the high-risk/problem gamblers from the other three groups, with the centroids revealing the greatest separation between the low-risk gamblers and the high-risk/problem gamblers. Participation in structured activities (i.e., involvement in sports and clubs) was the only consistent discriminating variable of this function across models. This may be due to the opportunities that participating on sports teams provide for placing bets on the outcome of sports events. Because such a small amount of the variance was accounted for by this function, however, few conclusions can be drawn.

Overall, the regression analyses and discriminant function analyses revealed a fairly consistent pattern of results when all participants were examined. Gender and unstructured activities were noteworthy predictors/discriminating variables across both analyses examining gambling behaviour. However, unlike the regression analyses, risk attitudes/perceptions was a noteworthy discriminating variable among the gambling groups. It may be that because the continuous variable of gambling was categorized in the discriminant function analysis, enough variance was created to allow risk attitudes/perceptions to be a noteworthy discriminating variable. Finally, the only consistent discriminating variable of the second function, participation in structured activities, also was consistent with the regression findings. Overall, gender,

participation in unstructured, participation in structured activities, and risk attitudes/perceptions often are found to be predictors of other risk behaviours (e.g., Griffin et al., 2003) suggesting that there may be a similar etiology to gambling participation as found with other risk behaviours.

Relation of Adolescent Gambling to Other Risk Behaviours

The nine risk behaviours examined in this study in relation to gambling included alcohol use, smoking, marijuana use, hard drug use, minor delinquency, major delinquency, sexual activity, direct aggression and indirect aggression. The frequency of participation in all risk behaviours was low, although, some risk behaviours were engaged in by more than 50% of the adolescents (i.e., alcohol use, direct aggression, gambling, and minor delinquency). While these activities were statistically normative, there did not appear to be a strong relation between gambling and the other risk behaviours, demonstrated by the low correlations.

Examination of co-occurrence based on correlations alone does not provide an accurate prediction of co-occurrence. Even if a correlation between behaviours is close to unity, one cannot determine the level at which the behaviours co-occur within individuals since corrections do not provide evidence of absolute agreement. Thus, correlations do not provide direct evidence that adolescents who engage in high-risk levels of one type of behaviour (for example) also engage in high-risk/problem levels of other risk behaviours. To examine the degree of co-occurrence from another perspective, the *number* of co-occurring risk behaviours at a high-risk level of engagement were counted (e.g., if an adolescent participated in high-risk/problem gambling, how many other behaviours did they also report participating in at a high-

risk/problem level?). The majority of at-risk and high-risk gamblers reported co-occurrence at a high-risk/problem level with no more than two of the nine risk behaviours. These findings provide support for the suggestion that there is only a small number of adolescents engaging in both at-risk or high-risk/problem gambling and other high-risk/problem risk behaviours

An examination of the relations among risk behaviours (correlations) and counting the number of co-occurring risk behaviours did not allow for the exploration of the specific risk behaviours that co-occurred with high-risk/problem gambling. Further analyses, therefore, examined the proportion of adolescents within each of the gambling groups that also reported high-risk/problem levels of engagement in each of the nine other risk behaviours. The proportion of high-risk/problem gamblers who also reported high-risk/problem levels of engagement in the other risk behaviours was fairly low (almost all were less than 50%). The top three most frequent co-occurring risk behaviours were direct aggression, minor delinquency and alcohol; behaviours which were statistically normative. This finding suggests that there is a limited number of co-occurring risk behaviours with gambling and that the extent of the co-occurrence is not pervasive among adolescents.

Overall, participation in "high" levels of each of the nine risk behaviours increased with greater levels of risk related to gambling activity. This pattern was consistent across age and gender. Past research has reported similar results with alcohol use and minor delinquency (e.g., Barnes, Welte, Hoffman & Dintcheff, 1999; Gupta & Derevensky, 1998a; NRC, 1999; Stinchfield, 2000; Vitaro, Brendgen, Ladouceur, & Tremblay, 2001), although the relation between direct aggression and

gambling has not been reported previously. Past research has revealed a significant relation between gambling behaviour and impulsivity, particularly among male problem gamblers (Ibanez, et al., 2003; McDaniel & Zuckerman, 2003). Impulsivity also is related to direct aggression (Joireman, Anderson, & Strathman, 2003) suggesting a potential common influence for the co-occurrence, although only longitudinal data will be able to directly test this hypothesis.

The level of co-occurrence found in this study for engagement in high levels of risk behaviours suggests that the co-occurrence of high-risk/problematic gambling and high-risk involvement in other risk behaviours appears to occur primarily with a limited number of normative risk behaviours. To date, no studies have examined the co-occurrence of high-risk/problem gambling with a wide range of risk behaviours among adolescents. In most cases, previous research has used correlation analyses alone to examine co-occurrence, rather than directly examining co-occurrence within individuals (e.g., Stinchfield, 2000; Vitaro et al., 2001). A prospective study could determine whether the co-occurrence found in this study is an adolescent-limited or life-course persistent phenomenon (Moffit, 1993). In addition, a prospective study could explore the etiology and temporal sequence of these behaviours. Finally, while the classification system used for each of the ten risk behaviours in this study was based on past research, it is important to note, however, that a different categorization scheme may result in different levels of co-occurrence.

Methodological Considerations

There are five main limitations to this study. First, this study was a cross-sectional study of a relatively homogenous sample. The findings may differ with a

more diverse sample. Many of the studies reported in the literature fail to report the ethnic and socioeconomic backgrounds of the participants (e.g., Derevensky & Gupta, 2000; Ferland, Ladouceur, & Vitaro, 2002; Fisher, 1993; Gupta & Derevensky, 1998). Of those studies which do report the ethnicity of the participants, the vast majority (usually > 90%) are Caucasian (e.g., Fisher, 2000; Giacopassi, Stitt, & Vandiver, 1998; Winters et al, 2002). It is not known whether adolescents from different ethnic backgrounds gamble at different rates from Caucasian adolescents. Further, is it not clear whether adolescents from different socio-economic backgrounds gamble at different rates than those adolescents from middle-class backgrounds. In addition, the lack of longitudinal data limits the conclusions that can be drawn as no causal relations can be established.

Second, the data collection was based a self-report procedure. A concern with self-report is the potential of shared method variance. Ideally, student responses would have been corroborated by parents, teachers, and/or friends to increase confidence in the accuracy of the participants' responses. As mentioned in the method section, however, researchers have demonstrated that when students are assured of confidentiality, self-report measures of risk behaviours have good validity (e.g., Murray & Perry, 1987; White, 1991). In addition, researchers examining aggression indicate that self-reports yield similar results to peer reports (Crick & Bigbee, 1998).

Third, the survey was two hours in length. Some participants were not able to complete the survey in the allotted time period. Due to the length of the survey and potential fatigue, participants may not have been as careful toward the end of the survey as they were at the beginning. For example, the gambling and sexual activity

questions appeared toward the end of the survey and participants may not have thought about the frequency of their involvement as carefully as they may had if they were not as fatigued. In addition, because the survey was done by scantron, it was too expensive to use a counterbalancing procedure to offset this concern. The data were, however, examined to determine if differences existed between those who completed the gambling questions and those who did not complete the gambling questions. No meaningful differences were found to exist, increasing the confidence that the length of the survey was not an important factor within this study.

Fourth, only those who had answered at least 50% of the gambling questions were included for analysis. This select sample may influence the generalizability of the results. Again, as there did not appear to be any meaningful differences between those adolescents who completed the gambling questions and those who did not complete the gambling questions, concerns about the generalizability of the finding are reduced.

Finally, one problem with understanding the extent of adolescent gambling is that few national studies exist. Given that the study of gambling is in its infancy, studies tend to be local in nature and frequently the studies are done in areas where there are casinos, with the result that cited prevalence rates may be higher than those cited had areas where no casino was present were included. This gap in the literature is a limitation of this study in that it was local in nature and many gambling opportunities exist within the geographic area.

Areas for Future Research

Five main areas for further research were identified. First, access to gambling opportunities within Canada has increased in the last few years (Azmier, 2000). Further, many adults view gambling as a socially acceptable recreational activity. Taken together, the increased availability of gambling opportunities and the social acceptance of gambling may have a direct impact on the extent of gambling among adolescents. Gambling may be viewed by adolescents also as an aspect of acceptable behaviour given that it is normative and legally supported in adulthood. In fact, they may not regard non-problematic gambling as a risk behaviour in the same way as substance use and delinquency. For example, gambling activities do not involve drugs and generally do not involve "illegal" activities. In addition, parents may not support adolescent participation in substance use or delinquency, but may condone gambling through the purchase of lottery tickets as gifts for their children. To understand how both adolescents and adults view gambling, their perceptions about why they gamble and their perceptions related to specific gambling activities require additional investigation.

Second, the prevalence of problematic adolescent gambling (8.2% in this study) appears to be much higher than in adults (ranges from 2 to 4%) (Derevensky, & Gupta, 2000b; Gupta & Derevensky, 1996; Jacobs, 2000). In fact, even using the same cutoff-score for classification of problematic gambling as used with adults (i.e., 5 or more consequences on the SOGS-RA), the prevalence of problematic adolescent gambling is still 7.9% in the present study. This high level of problematic gambling among adolescents cannot be ignored. The consequences of problematic gambling are

experienced by family, friends, and the gambler themselves resulting in possible breakdown of relationships and/or financial hardship. It is unclear if the prevalence rates of problematic adolescent gambling are a finding specific to this cohort (resulting from greater opportunities for gambling participation for adolescents today), which might in time, result in an increase in adult problem gambling. If these increases are found, early intervention programs are critical to reduce the long-term impact of adolescent problem gambling within society. This hypothesis requires additional longitudinal study. Following adolescent gambling behaviour over time also would allow for an examination of the progression of gambling problems and the factors that influence gambling behaviour during different transition periods.

Third, the gender differences found in this and other studies cannot be fully understood until a further examination of the intention behind participation in the gambling activities is addressed. Questions to be considered include: do females engage in different gambling activities from those that were included; are females' views of gambling different from males; and, are females less susceptible than males to becoming problem gamblers and if so, why?

Fourth, although this study focused only on direct predictors of gambling behaviour, it also is important to examine indirect predictors. Some of the 21 variables that were not noteworthy predictors in this study may, in fact, have important indirect effects on gambling. Extending the present study by testing possible direct and indirect effects of variables from across domains (family, intrapersonal, peer, school and neighborhood) and levels of influence (ultimate, distal, proximal) through the use of structural equation modeling is warranted. Including

additional potential predictors such as age of onset of gambling and parental gambling behaviour also is critical.

Fifth, a prospective study specifically examining high-risk/problematic gamblers is needed. In particular, examining the development of high-risk/problematic gambling, in relation to the co-occurrence of high involvement with other risk behaviours, could determine whether the co-occurrence found in this study is an adolescent-limited or life-course persistent phenomenon (Moffitt, 1993). In addition, a prospective study could explore the etiology and temporal sequence of these behaviours.

Gaining a better understanding of gambling behaviours will be critical to ensuring our ability to assist adolescents in successfully navigating the adolescent period. From a policy standpoint, understanding the predictors of gambling behaviour will be crucial in order for health professionals and educators to introduce prevention or harm reduction programs in a more timely fashion (i.e., before risk-taking endangers the physical and psychological health of the adolescents). Early intervention programs in the area of treatment also would benefit from knowledge of factors which predict at-risk gamblers.

Conclusions

Research on adolescent gambling behaviour is limited. This study contributed to the literature in three ways. First, this study examined gambling behaviour within a large normative adolescent sample rather than focusing only on problem gamblers. Overall, this study clearly demonstrated that while the majority of adolescents report gambling (particularly males), the frequency of gambling participation is quite low. It

may be that adolescents do not perceive gambling as a risk behaviour to the same extent as the other risk behaviours examined in this study (e.g., substance use). Specifically exploring adolescents' intentions regarding their participation in each gambling activity (i.e., how adolescents view entering draws, for example as an activity to support a charity or as gambling) may be critical to understanding gambling behaviour and the gender differences that were found in this study.

Second, this was the first study to examine a comprehensive set of factors across five domains (i.e., neighbourhood, school, family, peer, intrapersonal) in predicting adolescent gambling. Further, this was the first study to examine these same set of predictors in discriminating among four levels of risk associated with adolescent gambling (i.e., no risk/non-gamblers, low-risk, at-risk, high-risk/problematic gamblers). Overall, the correlations between the predictors and gambling involvement were low, most likely due to the low frequency of adolescent gambling. The strongest predictors of gambling involvement were gender, participation in unstructured activities, participation in structured activities, and risk attitudes/perceptions. These variables also are often found to be predictors of other risk behaviours (e.g., Griffin, et al., 2003). It will be important to examine, through a longitudinal study, whether the etiology of gambling behaviour is similar to the etiology of other risk behaviours.

Third, this study was the first to examine the co-occurrence of gambling behaviour with nine other risk behaviours. Although the degree of co-occurrence between gambling and the other risk behaviours was limited, the highest reported rates of occurrence were found among the high-risk/problematic gamblers. The

greatest co-occurrence of high-risk/problematic gambling with other risk behaviours was with alcohol, minor delinquency and direct aggression.

Finally, it is important to note that a sizeable minority of youth engage in gambling behaviour at a problematic level (8.2%). These adolescents are of concern to parents, educators, practitioners and policy makers. This study examined some of the potential predictors of problematic gambling behaviour, but also highlighted the need for further research into this area (e.g., definition of gambling, motivators for gambling, etc.). In fact, the social and economic impacts of gambling reinforce the need for policy makers to begin to examine gambling from a public health perspective.

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ɔendix A: Description of Measures

ıin	Measure	Description	Number of questions	Scale	Example of Questions
ıgraphics	Age	Participant age	1-item	9-point scale (1-"10" to 9-"18 or over")	How old are you?
	Gender	Participant gender	1-item	"male" or "female"	Are you male or female?
ıbourhood	Neighbourhood Quality (adapted from Health Canada's Community Action Programs for Children)	Perceived quality of neighbourhood	5-items (α=.66)*	5 pt (1 = "strongly agree" to 5 = "strongly disagree")	I feel safe in my neighbourhood.
	Substance Availability	Perceived availability of substances in neighbourhood	4-items (α=.93)*	4 pt (1 = "almost never or never" to 4 = "almost always or always")	How available is alcohol in your neighbourhood?
	Clubs - Community	Frequency of involvement in clubs outside of school	1-item	5 pt (1 ="every day" to 5 = "never")	How often in the last month have you participated in clubs outside of school?
	Sports – Community	Frequency of involvement in sports outside of school	1-item	5 pt (1 ="every day" to 5 = "never")	How often in the last month have you participated in sports outside of school?
	Church Attendance	Frequency of church attendance	1 item	5 pt (1 ="every day" to 5 = "never")	How often in the last month have you gone to church?
ɔl	School Culture (adapted from School Climate Survey - Kelly, Glover, Keefe, Halderson, Sorenson, & Speth, 1986)	School culture, asking about students, teachers, and administration	30-items (α=.93)*	5 pt (1 = "strongly agree" to 5 = "strongly disagree")	Most teachers in my school like their students.
	Substance Availability	Perceived availability of substances in school	4-items (α=.86)*	4 pt (1 = "almost never or never" to 4 = "almost always or always")	How available is alcohol in your school?
	Clubs – School	Frequency of involvement in school clubs	1-item	5 pt (1 ="every day" to 5 = "never")	How often in the last month have you participated in clubs at school?
	Sports – School	Frequency of involvement in school sports	1-item	5 pt (1 ="every day" to 5 = "never")	How often in the last month have you participated in school sports?
	Skipping Class	Frequency of skipping class	1-item	5 response items (1 = "6 or more times" to 5 = "never")	During a typical month of school, how often do you skip class?
	Grades	Average grades	1-item	6 pt (1 = "A+" to 6 = "below 50%")	
	School Goals	Educational goals	1-item	6 response items (1 = "don't know" to 6 = "obtaining professional training (e.g., Masters, Ph.D., physician)"	How far do you plan to go in school?
	Planfulness	Degree of planning ahead	1-item	4 pt (1 = "almost always or always" to 4 = "almost never or never")	Do you plan ahead for the things that you have to do each day
	Do well in school (self, friends, parents)	Perception of how important it is to friends, parents, and self that participant do well in school	3-items	5 pt (1 = "very important" to 5 = "don't know")	How important is it to your friends that you do well in school?
	Bored at School	Frequency of boredom in school	1-item	4 pt (1 = "all the time" to 4 = "never or almost never")	How often are you bored in school?
ly	Background	Assessed high risk background	5-items	Categorized as high risk if indicated being abused, mother was a teen mom, in foster care, parents receiving social assistance, OR parents with alcohol/drug problems	
	Mother's (Father's) Education		2-items (1 per parent)	6 pt (1 = "did not finish high school" to 6 = "completed a professional and/or graduate degree)	
	Curfew (week and weekend)	Curfew on school nights and on weekends	2-items (1 week, 1 weekend)	9 response items (1 = "not allowed out" to 9 = "as late as I want")	In a typical week, what is the latest you can stay out on a school night (Sunday through Thursday)?
	Talk with Parents	Frequency of talking with parents	1-item	4 pt (1 = "almost every day" to 4 = "almost never")	How much time do your parents/guardians spend talking with you?

)endix A: Description of Measures (continued)

)omain	Measure	Description	Number of questions	Scale	Example of Questions
'amily 'ont'd	Fun with Parents	Frequency of having fun with parents	1-item	4 pt (1 = "almost every day" to 4 = "almost never")	How often does your family do something fun together?
	Parents Know	How often parents really know about participant's activities	9-items (α = .90)*	4 pt (1 = "they always know" to 4 = "they never know")	How much do your parents/guardians really know where you go at night?
	Attachment – Dad (adapted from IPPA Scale - Armsden & Greenberg, 1987)	Quality of attachment to father	17-items (alpha = .87)*	4 pt (1 = "almost always or always" to 4 = "almost never or never")	My father trusts my judgment. My father can tell when I am upset about something.
	Attachment - Mom (same as above but with wording changed to mother)	Quality of attachment to mother	17-items (alpha = .89)*	4 pt (1 = "almost always or always" to 4 = "almost never or never")	
	Parents Ask	How often parents ask about participant's activities	9-items (α = .81)*	4 pt (1 = "1 tell them without their asking" to 4 = "they never ask")	How often do your parent/guardians ask you where you go at night?
	Siblings Risk Behavior	Perception of siblings' involvement in risk behaviors	4-items (α=.83)*	4 pt (1 = "almost never or never" to 4 = "almost always or always")	How often do you think your brothers or sisters drink alcohol?
	Parents Upset	Perception of how upset parents would be if participant engaged in risk behaviors	6-items (α=.79)*	4 pt (1 = "very upset" to 4 = "not at all upset")	How upset would your parents be if you had sex?
ıtrapersonal	Temperament – Separate Subscales for Adaptability, Activity, Rhythmicity, Flexibility, Mood, Distractibility, Persistence (adapted from DOTS-R by Windle & Learner, 1986)	Assessed aspects of temperament	a) activity level (α=.79) 3-items* b) sleep/rhythmicity (α=.58) 4-items* c) adaptability/approach/avoidance (α=.68) 5- items* d) flexibility (α=.36) 4-items* e) affect/mood (α=.85) 4-items* f) distractibility (α=.53) 4-items* g) persistence (α=.68) 3-items*	4 pt (1 = "almost always or always" to 4 = "almost never or never")	a) activity – I have a hard time sitting still b) sleep/rhythmicity – I wake up at different times c) approach/avoidance – I like trying new things d) flexibility – I can make myself at home anywhere e) affect/mood - I laugh and smile at a lot of things f) distractibility – I stay with an activity for a long time g) persistence - Once I start something, I finish it
	Life Satisfaction	Satisfaction with life	1-item	4 pt (1 = "almost always or always" to 4 = "almost never or never")	I am happy with my life.
	Religiosity	Degree of spirituality	1-item	3 pt (1 = "yes" to 3 = "no)	Religion is an important part of my life.
	Social Anxiety (adapted from Ginsberg, LaGreca & Silverman, 1998)	Social anxiety	14-items (α=.93)*	4 pt (1 = "almost never or never" to 4 = "almost always or always")	I only talk to other people my age that I know really well.
	Self-Esteem (Rosenberg Self-Esteem Scale, 1965)	Self-esteem	10-items (α=.90)*	5 pt (1 = "strongly agree" to 5 = "strongly disagree")	I feel that I have a number of good qualities
	Depression (CES-D, NIMH, 1972)	Assessed depressive symptoms in the past 2 weeks	20-items (α=.92)*	5 pt (1 = "none of the time" to 5 = "most of the time")	I felt that I was just as good as other people.
	Daily Hassles	Frequency of daily hassles	25-items (α=.72)*	3 pt (1 = "almost never bothers me" to 3 = "often bothers me")	How often does it bother you to have problems with classmates?
	Risky for You	Perception of how risky it is to engage in risk behaviors	7-items (α=.84)*	5 pt (1 ="every day" to 5 = "never")	How risky do you believe it is for you to smoke marijuana?
	Risky for Others	Perception of how risky it is for others to engage in risk behaviors	7-items (α=.88)*	5 pt (1 ="every day" to 5 = "never")	How risky do you believe it is for other people your age to be drinking alcohol?
	Tolerance of Deviance (adapted from Jessor, 1995)	Perception of how wrong it is to engage in risk behaviors	11-items (α=.89)*	4 pt (1 = "very wrong" to 4 = "not at all wrong")	How wrong do you think it is to break into a place that is locked just to look around?
eers	Dating	Frequency of dating	1 item	5 pt (1 ="every day" to 5 = "never")")	How often in the last month have you gone on a date?
	Hung out with friends	Frequency of hanging out with friends	1 item	5 pt (1 ="every day" to 5 = "never")	How often in the last month have you hung out with friends?
	Partying	Frequency of attending parties	1 item	5 pt (1 ="every day" to 5 = "never")	How often in the last month have you gone to parties?

ɔendix A: Description of Measures (continued)

Domain	Measure	Description	Number of questions	Scale	Example of Questions
'eers Cont'd	Best Friend Quality (adapted from scale by Gauze, Bukowski, Aquan-Asse, & Sippola, 1996)	Assessed quality of best friend relationship	18-items (alpha = .91)*	4 pt (1 = "almost always or always" to 4 = "almost never or never")	My best friend and I spend all our free time together If I have a problem at school or at home, I can talk to my best friend about it
	Friendship Quality (adapted from parental attachment measure, with wording changed to "friends")		18-items (alpha = .94)*	4 pt (1 = "almost always or always" to 4 = "almost never or never")	My friends understand me.
	Victimization - Direct and Indirect (adapted from the School Life Questionnaire by Marini, Spear & Bombay, 1999)	Frequency of direct and indirect victimization	a) direct (α=.81) 4-items* b) indirect (α=.72) 4-items*	5 pt (1 ="every day" to 5 = "never")	a) direct: How often in the last school year have you been pushed and shoved? b) indirect: How often in the last school year have you received hurtful and unsigned notes?
	Friends Upset	Perception of how upset friends would be if participant engaged in risk behavior	6-items (α=.89)*	4 pt (1 = "very upset" to 4 = "not at all upset")	How upset would your friends be if you smoked?
Problem Behaviors	Smoking	Frequency of smoking	1-item	9 pt (0 = "I don't smoke" to 8 = "more than 1 pack a day")	How many cigarettes do you usually smoke each day?
	Alcohol	Frequency and quantity per occasion	2-items (r = .59). Z-scores were averaged.	Frequency 9 pt (0 = "never" to 8 = "every day"); Quantity 7 pt (0 = "less than 1" to 6 = "over 10")	How often do you go drinking or have a drink (alcohol)? On average, when you are drinking alcohol, about how many drinks do you have?
	Marijuana	Frequency of marijuana use	1-item	6 pt (1 = "never" to 6 = "every day")	In the past 12 months, how often did you use hash or marijuana (weed, joint)?
	Hard Drugs	Frequency of cocaine, stimulants, depressants, heroin, acid, and club drugs (e.g., ecstasy) use	6-items (α=.92)*	6 pt (1 = "never" to 6 = "every day")	In the past 12 months, how often did you use uppers, beans, speed (stimulants)?
	Sexual Activity	Frequency of touching, oral sex, and sexual intercourse	3-items (α=.93)*	6 pt (1 = "never" to 6 = "every day")	In the last 12 months, how often have you had sexual intercourse?
	Direct and Indirect Aggression (adapted from Marini, Spear & Bombay, 1999)	Frequency of direct and indirect aggression	a) direct (α=.83) 4-items* b) indirect (α=.77) 4-items*	5 pt (1 ="every day" to 5 = "never")	a) direct: How often in the last school year have you pushed and shoved someone? b) indirect: How often in the last school year have you spread rumors and untrue stories?
	Major Delinquency	Frequency of joining a gang, carrying a gun as a weapon and carrying a knife as a weapon	3-items (α=.71)*	4 pt (1 = "never" to 4 = "more than 5 times")	In the last 12 months, how often have you joined a gang?
	Minor Delinquency	Frequency of shoplifting, sneaking out at night, joyriding in a car, and wrecking other people's property	4-items (α=.62)*	4 pt (1 = "never" to 4 = "more than 5 times")	In the last 12 months, how often have you shoplifted?
	Gambling (Consequences from South Oaks Gambling Screen – Revised for Adolescents, Winters, Stinchfield, & Fulkerson, 1993)	Frequency (e.g., playing bingo, lotteries, cards for money, etc.) and consequences of gambling	a) Frequency 8-items (α=.83)* b) Consequences 6-items (α=.88)	Frequency 5 pt (1 = "never" to 5 = "every day") Consequences 4 pt (1 = "never" to 4 = "every time")	Frequency – How many times in the last month have you gone to bingo? Consequences – In the past 12 months, have you ever tried but could not stop gambling (consequences only used when creating levels i.e., assessing problematic gambling use)?

ote. * Average composite score was created.

Appendix B: Questions

Note: Items were reverse coded when appropriate.

Demographics

Age

How old are you?

O 10 or younger O 11 O 12 O 13 O 14
O 15 O 16 O 17 O 18 or over

Gender

Are you male or female?

O Male O Female

Ethnicity

Were you born in Canada?

O Yes O No ➔ If No, how long have you been living in Canada?

Other than Canadian, is there another culture or ethnic background that your family belongs to?

O Yes O No

If yes, which one? **(Fill in all that apply)**

O American O French O Italian O Russian
O Chinese O German O Korean O Ukrainian
O Dutch O Greek O Native/Aboriginal O Other- Which one?

O British O Hungarian O Polish

Who do you live with right now? (Fill in all that apply)

O Both birth parents O Birth father only O Birth mother only
O Birth mother and stepfather O Birth father and stepmother O Neither birth parent
O Adoptive parents O Foster parents O Legal guardian
O Grandparent(s) O Other relatives O On your own
O With roommates O Group home O Other _____

Background

Abuse

One bad thing that happened to me was_____

Teenage Mom

How old is (or would be) your birth mother right now?

O 22-27 O 28-33 O 34-39 O 40-45 O OVER 45 O DON'T KNOW

Foster Care

Have you ever been in foster care?
O Yes O No

Social Assistance

Does your family receive welfare cheques/social assistance?
O Yes O No O Don't Know

Parental Alcohol/Drug Problem

Did either of your parents or guardians drink or use drugs so often that it caused problems for the family?
O Yes O No

Temperament

Activity Level General Subscale

	ALMOST NEVER OR NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS OR ALWAYS
I have a hard time sitting still.....	...O...	...O...	.O...	...O...
If I have to stay in one place for a long time, I get very restless.....	...O...	...O...	.O...	...O...
Even when I am supposed to be still, I get fidgety after a few minutes.....	...O...	...O...	.O...	...O...

Approach/Withdrawal Subscale

	ALMOST NEVER OR NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS OR ALWAYS
I can make myself at home anywhere.....	...O...	...O...	.O...	...O...
I am interested in new objects shown to me.....	...O...	...O...	.O...	...O...
I like trying new things.....	...O...	...O...	.O...	...O...
My first response to anything new is to e interested in it.....	...O...	...O...	.O...	...O...
I like meeting new people.....	...O...	...O...	.O...	...O...

Flexibility/Rigidity Subscale

	ALMOST NEVER OR NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS OR ALWAYS
It takes me a long time to get used to new things at home.....	...O...	...O...	.O...	...O...
I do not like changes in routine.....	...O...	...O...	.O...	...O...

Rythmicity/Sleep Subscale

	ALMOST NEVER OR NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS OR ALWAYS
I wake up at different times	...O...	...O...	.O...	...O...
No matter when I go to sleep, I wake up at the same time the next morning	...O...	...O...	.O...	...O...
I get the same amount of sleep each night	...O...	...O...	.O...	...O...
I have trouble getting to sleep at night	...O...	...O...	.O...	...O...

Mood Subscale

	ALMOST NEVER OR NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS OR ALWAYS
I laugh and smile at a lot of things	...O...	...O...	.O...	...O...
My mood is generally cheerful	...O...	...O...	.O...	...O...
I laugh several times a day	...O...	...O...	.O...	...O...
I smile often	...O...	...O...	.O...	...O...

Distractibility Subscale

	ALMOST NEVER OR NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS OR ALWAYS
Once I'm doing something, nothing can distract me from it	...O...	...O...	.O...	...O...
I can be distracted by something else, no matter what I might be doing	...O...	...O...	.O...	...O...
If I am doing one thing, something else happening won't get me to stop	...O...	...O...	.O...	...O...

Persistence Subscale

	ALMOST NEVER OR NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS OR ALWAYS
When I do things, I do them until they are finished	...O...	...O...	.O...	...O...
Once I start something, I finish it	...O...	...O...	.O...	...O...
I stay with an activity for a long time	...O...	...O...	.O...	...O...

Parental Education

Father's Education

What is the highest level of education your FATHER/STEPFATHER (male guardian) completed?

- O Did not finish high school
- O Finished high school
- O Some college, university, or apprenticeship program
- O Completed a college/apprenticeship diploma (e.g., electrician) and/or technical diploma (i.e. graphic design, hair dressing)
- O Completed a university undergraduate degree
- O Completed a professional degree (e.g., masters, PhD, medical doctor, lawyer)

Mother's Education

What is the highest level of education your MOTHER/STEPMOTHER (female guardian) completed?

- O Did not finish high school
- O Finished high school
- O Some college, university, or apprenticeship program
- O Completed a college/apprenticeship diploma (e.g., electrician) and/or technical diploma (i.e. graphic design, hair dressing)
- O Completed a university undergraduate degree
- O Completed a professional degree (e.g., masters, PhD, medical doctor, lawyer)

Neighbourhood Quality

Sense of Neighbourhood

	STRONGLY AGREE	AGREE	NEITHER AGREE OR DISAGREE	DISAGREE	STRONGLY DISAGREE
I feel safe in my neighbourhood	O	O	O	O	O
Children in my neighbourhood have no place to play but on the street	O	O	O	O	O
I feel like I belong to my neighbourhood	O	O	O	O	O
I feel that people of different cultures and races are accepted in my neighbourhood					
I feel proud to be a member of my neighbourhood	O	O	O	O	O

Substance Availability

School Availability

How available are the following substances in your school?

	ALMOST NEVER OR NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS OR ALWAYS
Alcohol	O	O	O	O
Cigarettes	O	O	O	O
Marijuana (weed, joint)	O	O	O	O
Other illegal drugs	O	O	O	O

Neighbourhood Availability

How available are the following substances in your neighbourhood?

	ALMOST NEVER OR NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS OR ALWAYS
Alcohol	O	O	O	O
Cigarettes	O	O	O	O
Marijuana (weed, joint)	O	O	O	O
Other illegal drugs	O	O	O	O

School Culture

What do you think of the following statements?

	STRONGLY AGREE	AGREE	NEITHER AGREE NOR DISAGREE	DISAGREE	STRONGLY DISAGREE
Most teachers in my school like their students	O	O	O	O	O
Most teachers in my school are on the side of their students	O	O	O	O	O
Most teachers give students the grades they deserve	O	O	O	O	O
Most teachers help students to be friendly and kind to each other	O	O	O	O	O
Most teachers treat each student as an individual	O	O	O	O	O
Most teachers are willing to help students	O	O	O	O	O
Most teachers are patient when a student has trouble learning	O	O	O	O	O
Most teachers make extra efforts to help students	O	O	O	O	O
Most teachers understand and meet the needs of each student	O	O	O	O	O
Most teachers praise students more often than they get angry with them	O	O	O	O	O
Most teachers are fair to students	O	O	O	O	O
Most teachers explain carefully so that students can get their work done	O	O	O	O	O
Most students here school understand why they are in school	O	O	O	O	O
Most students in my school are interested in learning new things	O	O	O	O	O
Most students in my school have fun but also work hard	O	O	O	O	O
If one student makes fun of someone, other students do not join in	O	O	O	O	O
Most students in my school are well-behaved even when the teachers is not watching	O	O	O	O	O
Most students will do their work even if the teacher steps out of the classroom	O	O	O	O	O
There is a clear set of rules for students to follow in my school	O	O	O	O	O
Most teachers spend almost all classroom time in learning activities	O	O	O	O	O
Most students in my school usually have assigned schoolwork to do	O	O	O	O	O
Most classroom time is spent talking about class work or assignments	O	O	O	O	O
Most students work hard to complete their school assignments	O	O	O	O	O
Most students are able to take part in school activities in which they are interested	O	O	O	O	O
Most students can be in sports, music, and plays even if they are not very talented	O	O	O	O	O
Most students are comfortable staying after school for activities such as sports and music	O	O	O	O	O
Students can take part in sports and other school activities even if their families can not afford it	O	O	O	O	O
The rules in my school are fair	O	O	O	O	O
The rules in my school are strongly enforced	O	O	O	O	O
Most students and teachers work together to make decisions about the rules in my school	O	O	O	O	O

Parental Monitoring

Weekday Curfew

In a typical week, what is the latest you can stay out on WEEK NIGHTS (Sunday-Thursday)?

O Not allowed out	OBefore 9:00 pm	O 9:00 pm to 9:59 pm
O 10:00 pm to 10:59 pm	O 11:00 pm to 11:59 pm	O 12:00 am to 12:59 am
O 1:00 am to 1:59 am	O After 2:00 am	O As late as I want

Weekend Curfew

In a typical week, what is the latest you can stay out on FRIDAY OR SATURDAY NIGHT?

O Not allowed out	OBefore 9:00 pm	O 9:00 pm to 9:59 pm
O 10:00 pm to 10:59 pm	O 11:00 pm to 11:59 pm	O 12:00 am to 12:59 am
O 1:00 am to 1:59 am	O After 2:00 am	O As late as I want

Parents Ask

Do your parents/guardians ASK you....

	I TELL THEM WITHOUT THEIR ASKING	THEY SOMETIMES ASK	THEY NEVER ASK	THEY OFTEN AS
where you go at night?	O	O	O	O
what you do with your free time?	O	O	O	O
who your friends are?	O	O	O	O
where you are most afternoons after school?	O	O	O	O
how much time you spend on the computer or playing video games?	O	O	O	O
what websites you look at on the Internet?	O	O	O	O
what video or computer games you play?	O	O	O	O
what you watch on TV?	O	O	O	O
what you do when you are in your room?	O	O	O	O

Relationship With Parents

Attachment to Mother

Think about your mother/stepmother (female guardian) who you live with the most and answer these questions. If you have NO contact with your mother/stepmother or female guardian, please SKIP to Part U below.

	ALMOST ALWAYS OR ALWAYS	OFTEN	SOMETIMES	ALMOS NEVER O NEVER
My mother trusts my judgement	O	O	O	O
My mother accepts me as I am	O	O	O	O
I like to get my mother's point of view on things I'm concerned about	O	O	O	O
My mother can tell when I'm upset about something	O	O	O	O
Talking over my problems with my mother makes me feel ashamed or foolish	O	O	O	O
My mother expects too much from me	O	O	O	O
I get upset a lot more than my mother knows about	O	O	O	O
When we discuss things, my mother cares about my point of view	O	O	O	O
My mother has her own problems, so I don't bother her with mine	O	O	O	O
I tell my mother about my problems and troubles	O	O	O	O
I feel angry with my mother	O	O	O	O
My mother understands me	O	O	O	O
I trust my mother	O	O	O	O

	ALMOST ALWAYS OR ALWAYS	OFTEN	SOMETIMES	ALMOST NEVER O NEVER
My mother doesn't understand what I'm going through these days	O	O	O	O
I get upset easily around my mother	O	O	O	O
I don't get much attention from my mother	O	O	O	O
I can count on my mother when I need to get something off my chest	O	O	O	O

Attachment to Father

Think about your father/stepfather (male guardian) who you live with the most and answer these questions. If you have NO contact with your father/stepfather or male guardian, please SKIP to Part U below.

	ALMOST ALWAYS OR ALWAYS	OFTEN	SOMETIMES	ALMOST NEVER OR NEVER
My father trusts my judgement	O	O	O	O
My father accepts me as I am	O	O	O	O
I like to get my father's point of view on things I'm concerned about	O	O	O	O
My father can tell when I'm upset about something	O	O	O	O
Talking over my problems with my father makes me feel ashamed or foolish	O	O	O	O
My father expects too much from me	O	O	O	O
I get upset a lot more than my father knows about	O	O	O	O
When we discuss things, my father cares about my point of view	O	O	O	O
My father has his own problems, so I don't bother him with mine	O	O	O	O
I tell my father about my problems and troubles	O	O	O	O
I feel angry with my father	O	O	O	O
My father understands me	O	O	O	O
I trust my father	O	O	O	O
My father doesn't understand what I'm going through these days	O	O	O	O
I get upset easily around my father	O	O	O	O
I don't get much attention from my father	O	O	O	O
I can count on my father when I need to get something off my chest	O	O	O	O

Have Fun with Parents

How often do these things happen in your family:

	ALMOST EVERY DAY	A FEW TIMES A WEEK	A FEW TIMES A MONTH	ALMOST NEVER
My family does something fun together	O	O	O	O

Talk with Parents

How often do these things happen in your family:

	ALMOST EVERY DAY	A FEW TIMES A WEEK	A FEW TIMES A MONTH	ALMOST NEVER
My parents/guardians spend time just talking with me	O	O	O	O

Parent's Knowledge of Activities

How much do your parents/guardians REALLY know....

	THEY ALWAYS KNOW	THEY USUALLY KNOW	THEY SOMETIMES KNOW	THEY NEVER KNOW
where you go at night?	O	O	O	O
what you do with your free time?	O	O	O	O
who your friends are?	O	O	O	O
where you are most afternoons after school?	O	O	O	O
how much time you spend on the computer or playing video games?	O	O	O	O
what web sites you look at on the Internet?	O	O	O	O
what video or computer games you play?	O	O	O	O
what you watch on TV?	O	O	O	O
what you do when you are in your room?	O	O	O	O

Peer Victimization

Direct Victimization

How often have these things been DONE TO YOU during the LAST SCHOOL YEAR?

	NEVER	A FEW TIMES A YEAR	A FEW TIMES A MONTH	A FEW TIMES A WEEK	EVERY DAY
Been pushed and shoved	O	O	O	O	O
Been sworn at and called names	O	O	O	O	O
Been teased and ridiculed	O	O	O	O	O
Been kicked and hit	O	O	O	O	O

Indirect Victimization

How often have these things been DONE TO YOU during the LAST SCHOOL YEAR?

	NEVER	A FEW TIMES A YEAR	A FEW TIMES A MONTH	A FEW TIMES A WEEK	EVERY DAY
Received hurtful and unsigned notes	O	O	O	O	O
Been excluded from joining an activity	O	O	O	O	O
Had rumours and untrue stories of you spread around	O	O	O	O	O
Had another student dare someone to hurt you	O	O	O	O	O

Friendship Quality

Best Friendship Quality

Think about your very BEST FRIEND and answer the following questions.

	ALMOST ALWAYS OR ALWAYS	OFTEN	SOMETIMES	ALMOST NEVER OR NEVER
My best friend and I spend all our free time together	O	O	O	O
If my best friend or I do something that bothers the other one of us, we can make up easily.	O	O	O	O
Sometimes my best friend and I just sit around and talk about things like school, sports, and things we like.	O	O	O	O
If I forgot my lunch or needed a little money, my best friend would lend it to me	O	O	O	O
My best friend helps me when I am having trouble with something	O	O	O	O
I feel happy when I am with my best friend	O	O	O	O
I get into fights with my best friend	O	O	O	O
If other kids were bothering me my best friend would help me	O	O	O	O
When I do a good job at something, my best friend is happy for me	O	O	O	O
My best friend bugs me or annoys me even though I ask him or her not to	O	O	O	O
If I have a problem at school or at home I can talk to my best friend about it	O	O	O	O
Sometimes my best friend does things for me, or makes me feel special	O	O	O	O
My best friend and I argue a lot	O	O	O	O
If I said I was sorry after I had a fight with my best friend he or she would still stay mad at me	O	O	O	O
My best friend and I go to each other's houses after school and on weekends	O	O	O	O
I think about my best friend even when my friend is not around	O	O	O	O
My best friend would stick up for me if another kid was causing me trouble	O	O	O	O
If there is something bothering me I can tell my best friend about it even if it is something I cannot tell other people	O	O	O	O

Friendship Quality

Think about your FRIENDS and answer the following questions.

	ALMOST ALWAYS OR ALWAYS	OFTEN	SOMETIMES	ALMOST NEVER OR NEVER
I like to get my friends' point of view on things I'm concerned about	O	O	O	O
My friends can tell when I'm upset about something	O	O	O	O
When we discuss things, my friends care about my point of view	O	O	O	O
Talking over my problems with my friends makes me feel ashamed and foolish	O	O	O	O
I wish I had different friends	O	O	O	O
My friends understand me	O	O	O	O
My friends accept me as I am	O	O	O	O
My friends don't understand what I'm going through these days	O	O	O	O
I feel alone or apart when I am with my friends	O	O	O	O
My friends listen to what I have to say	O	O	O	O
My friends are fairly easy to talk to	O	O	O	O
My friends are concerned about my well being	O	O	O	O
I feel angry with my friends	O	O	O	O
I can count on my friends when I need to get something off my chest	O	O	O	O
I trust my friends	O	O	O	O
I get upset a lot more than my friends know about	O	O	O	O
It seems as if my friends are irritated with me for no reason	O	O	O	O
I tell my friends about my problems and troubles	O	O	O	O

Sibling Risk Behaviour

How often do you think your brothers or sisters do the following activities? (If you have NO brothers or sisters please skip to the next question)

	ALMOST NEVER OR NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS OR ALWAYS
Drinking Alcohol	O	O	O	O
Smoking Cigarettes	O	O	O	O
Smoking Marijuana (weed)	O	O	O	O
Using other illegal drugs	O	O	O	O

Academic Orientation

Grades

What marks do you usually get in school?

O A+ (90%-100%) O A (80%-89%) O B (70%-79%) O C (60%-69%) O D (50%-59%) O (BELOW 50%)

Educational Goals

How far do you plan to go in school? (Choose only one answer)

- O don't know
- O Not finish high school
- O Finish high school.
- O Take some college, university, or apprenticeship courses after high school, but may not get a degree.
- O Complete a college/apprenticeship diploma (e.g., electrician) and/or technical diploma (e.g., graphic design, hair dressing)
- O Finish my undergraduate degree at a university.
- O Obtain professional training (e.g. Masters, PhD., medical doctor, lawyer, etc.)

Planfulness

Do you plan ahead for the things you have to do each day?

O ALWAYS OR ALMOST ALWAYS O OFTEN O SOMETIMES O NEVER OR ALMOST NEVER

Bored at School

Please rate the following statements/questions:

	ALL OF THE TIME	MOST OF THE TIME	SOME OF THE TIME	NEVER OR ALMOST NEVER
How often do you feel bored in school?..	O	O	O	O

Importance of Academic Achievement

How important is it.....

	VERY IMPORTANT	IMPORTANT	SOMEWHAT IMPORTANT	NOT AT ALL IMPORTANT	NOT SURE
To you that you do well in school?.....	O	O	O	O	O

How important is it.....

	VERY IMPORTANT	IMPORTANT	SOMEWHAT IMPORTANT	NOT AT ALL IMPORTANT	NOT SURE
To your parents that you do well in school?.....	O	O	O	O	O

How important is it.....

	VERY IMPORTANT	IMPORTANT	SOMEWHAT IMPORTANT	NOT AT ALL IMPORTANT	NOT SURE
To your friends that you do well in school?.....	O	O	O	O	O

Religiosity

Attendance at Religious Services

How often in the LAST MONTH have you done the following?

	EVERY DAY	SEVERAL TIMES A WEEK	ONCE A WEEK	ONCE OR TWICE A MONTH	NEVER
Gone to church/synagogue/temple etc.....	O	O	O	O	O

Spirituality

How do the following statements apply to you?

	Yes	Not Sure	No
Religion is an important part of my life.....	O	O	O

Structured Activities

Sports at School

How often in the LAST MONTH have you done the following?

	EVERY DAY	SEVERAL TIMES A WEEK	ONCE A WEEK	ONCE OR TWICE A MONTH	NEVER
Played school sports.....	O	O	O	O	O

Sports Outside of School

How often in the LAST MONTH have you done the following?

	EVERY DAY	SEVERAL TIMES A WEEK	ONCE A WEEK	ONCE OR TWICE A MONTH	NEVER
Played organized sports outside of school.....	O	O	O	O	O

Clubs at School

How often in the LAST MONTH have you done the following?

	EVERY DAY	SEVERAL TIMES A WEEK	ONCE A WEEK	ONCE OR TWICE A MONTH	NEVER
Gone to school clubs (e.g., music, student council)...	O	O	O	O	O

Clubs Outside of School

How often in the LAST MONTH have you done the following?

	EVERY DAY	SEVERAL TIMES A WEEK	ONCE A WEEK	ONCE OR TWICE A MONTH	NEVER
Gone to clubs outside of school.....	O	O	O	O	O

Well-Being

Depression

Fill in the answer that best describes how often you felt or behaved this way DURING THE PAST TWO WEEKS.

	NONE OF THTIME (LESS THAN 1DAY)	RARELY (1-2 DAYS)	SOME OF THE TIME (3-5 DAYS)	OCCASIONALLY (6-9 DAYS)	MOST OF THE TIME (10 - 14 DAYS)
I was happy.....	O	O	O	O	O
I did not feel like eating; my appetite was poor.....	O	O	O	O	O
I felt that I could not stop feeling sad, even with help from my family and friends.....	O	O	O	O	O
I felt that I was just as good as other people.....	O	O	O	O	O
I had trouble keeping my mind on what I was doing.....	O	O	O	O	O
I felt depressed.....	O	O	O	O	O
I felt that everything I did was an extra effort.....	O	O	O	O	O
I felt hopeful about the future.....	O	O	O	O	O
I thought my life had been a failure.....	O	O	O	O	O
I felt fearful.....	O	O	O	O	O
My sleep was restless.....	O	O	O	O	O
I was bothered by things that usually don't bother me....	O	O	O	O	O
I talked less than usual.....	O	O	O	O	O
I felt lonely.....	O	O	O	O	O
People were unfriendly.....	O	O	O	O	O
I felt like doing nothing.....	O	O	O	O	O
I had crying spells.....	O	O	O	O	O
I felt sad.....	O	O	O	O	O
I felt that people disliked me.....	O	O	O	O	O
I enjoyed life.....	O	O	O	O	O

Social Anxiety

In the chart below, fill in the answer that best suits you.

	ALMOST NEVER OR NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS OR ALWAYS
I'm quiet when I'm with a group of other people my age	O	O	O	O
I only talk to other people my age that I know really well	O	O	O	O
I feel that other people my age talk about me behind my back	O	O	O	O
I worry about what other people my age think of me	O	O	O	O
I feel that other people my age are making fun of me	O	O	O	O
I'm afraid that other people my age will not like me	O	O	O	O
If I get into an argument with another person, I worry that he or she won't like me	O	O	O	O
I worry about being teased	O	O	O	O
I feel shy with people my age that I don't know	O	O	O	O
I get nervous when I talk to people my age that I don't know very well	O	O	O	O
I worry about doing something new in front of other people my age	O	O	O	O
I feel shy even with other people my age I know well	O	O	O	O
It's hard for me to ask other people my age to hang out with me	O	O	O	O
I'm afraid to invite other people my age to my house because they might say no	O	O	O	O

Self-Esteem

Fill in the answer that best describes the way you feel

	STRONGLY AGREE	AGREE	NEITHER AGREE NOR DISAGREE	DISAGREE	STRONGLY DISAGREE
On the whole I am satisfied with my life	O	O	O	O	O
I feel that I have a number of good qualities	O	O	O	O	O
I am able to do things as well as most people	O	O	O	O	O
I feel I do not have much to be proud of	O	O	O	O	O
I feel useless at times	O	O	O	O	O
I feel that I am a person of worth, at least equal with others	O	O	O	O	O
I wish I could like myself more	O	O	O	O	O
All in all, I tend to feel that I am a failure	O	O	O	O	O
At times I think I am no good at all	O	O	O	O	O
I take a positive attitude toward myself	O	O	O	O	O

Life Satisfaction

	ALMOST ALWAYS OR ALWAYS	OFTEN	SOMETIMES	ALMOST NEVER OR NEVER
I am happy with my life	O	O	O	O

Daily Hassles

Below is a list of daily hassles that commonly bother students. Please indicate how often each one bothers you.

	ALMOST NEVER BOTHERS ME	SOMETIMES BOTHERS ME	OFTEN BOTHERS ME
Classroom is too noisy	O	O	O
Not having enough time	O	O	O
Not having enough money	O	O	O
Deciding what to wear	O	O	O
Getting up in the morning	O	O	O
My weight	O	O	O
Mean/strict teacher	O	O	O
Having homework every day	O	O	O
Not enough close friends	O	O	O
Not enough time to talk with friends	O	O	O
Too few dates	O	O	O
How I look	O	O	O
Problems with classmates	O	O	O
Problems with friends	O	O	O
Getting to class on time	O	O	O
Problems with boyfriend/girlfriend	O	O	O
Problems with my family	O	O	O
Being lonely	O	O	O
Being disorganized	O	O	O
Others' opinions of me	O	O	O
Not enough sleep	O	O	O
Shopping	O	O	O
Taking tests	O	O	O
Household chores	O	O	O
Fixing hair in morning	O	O	O

Unstructured Activities

Skipping Classes

During a TYPICAL MONTH of school, how often do you skip class?

O	O	O	O	O
6 OR MORE TIMES	4 TO 5 TIMES	2 TO 3 TIMES	ONCE	NEVER

Partying

How often in the LAST MONTH have you done the following?

	EVERY DAY	SEVERAL TIMES A WEEK	ONCE A WEEK	ONCE OR TWICE A MONTH	NEVER
Gone to parties	O	O	O	O	O

Hanging Out with Friends

How often in the LAST MONTH have you done the following?

	EVERY DAY	SEVERAL TIMES A WEEK	ONCE A WEEK	ONCE OR TWICE A MONTH	NEVER
Hung out with friends outside of school time.....	O	O	O	O	O

Dating

How often in the LAST MONTH have you done the following?

	EVERY DAY	SEVERAL TIMES A WEEK	ONCE A WEEK	ONCE OR TWICE A MONTH	NEVER
Gone out with someone (dated).....	O	O	O	O	O

Risk Attitudes/Perceptions

Parents Upset by Risk Behaviours

How upset would your PARENTS be if they found out that YOU were doing the following?

	VERY UPSET	UPSET	A LITTLE UPSET	NOT AT ALL
Dieting Constantly.....	O	O	O	O
Drinking Alcohol.....	O	O	O	O
Smoking Cigarettes.....	O	O	O	O
Smoking Marijuana (weed).....	O	O	O	O
Using other illegal drugs.....	O	O	O	O
Having Sex.....	O	O	O	O

Friends Upset by Risk Behaviours

How upset would your FRIENDS be if they found out that YOU were doing the following?

	VERY UPSET	UPSET	A LITTLE UPSET	NOT AT ALL
Dieting Constantly.....	O	O	O	O
Drinking Alcohol.....	O	O	O	O
Smoking Cigarettes.....	O	O	O	O
Smoking Marijuana (weed).....	O	O	O	O
Using other illegal drugs.....	O	O	O	O
Having Sex.....	O	O	O	O

How Wrong/Intolerance for Deviance

How wrong do you think it is to do these things?

	VERY WRONG	WRONG	A LITTLE BIT WRONG	NOT AT ALL WRONG
To take little things that don't belong to you	O	O	O	O
To give your teacher a fake excuse for being absent	O	O	O	O
To bother people in a movie theatre even if you have been asked to stop	O	O	O	O
To borrow $5 or so from a friend without really expecting to pay it back	O	O	O	O
To cheat on a est	O	O	O	O
To skip school without a good excuse	O	O	O	O
To get into fist fights with other eople	O	O	O	O
To break something that belongs to another person just to get ven	O	O	O	O
To break into a place that is locked just to look around	O	O	O	O
To damage public or private property that does not belong to you just for fun	O	O	O	O
To threaten a teacher because you were angry about something at chool	O	O	O	O

Riskiness of Engagement in Risk Behaviours.

How risky do you believe it is for YOU to be doing the following things?

	VERY HIGH	HIGH	MEDIUM	LOW	VERY LOW
Being Different from your Friends.	O	O	O	O	O
Dieting Constantly	O	O	O	O	O
Drinking Alcohol	O	O	O	O	O
Smoking Cigarettes	O	O	O	O	O
Smoking Marijuana(weed, joint)	O	O	O	O	O
Using other illegal drugs	O	O	O	O	O
Having Sex	O	O	O	O	O

How risky do you believe it is for OTHER PEOPLE YOUR OWN AGE to be doing the following things?

	VERY HIGH	HIGH	MEDIUM	LOW	VERY LOW
Being different from their friends	O	O	O	O	O
Dieting Constantly	O	O	O	O	O
Drinking Alcohol	O	O	O	O	O
Smoking Cigarettes	O	O	O	O	O
Smoking Marijuana (weed)	O	O	O	O	O
Using other illegal drugs	O	O	O	O	O
Having Sex	O	O	O	O	O

Risk Behaviours

Gambling Activities

How many times in the LAST MONTH have you done the following?

	NEVER	ONCE OR TWICE A MONTH	ONCE A WEEK	SEVERAL TIMES A WEEK	EVERY DAY
Played cards (Poker, Euchre) for money	O	O	O	O	O
Played Pokemon, Crazybones, Bingo, etc., for keeps or money	O	O	O	O	O
Played cards, Pokemon, Crazybones, Bingo, etc., NOT for keeps or money	O	O	O	O	O
Bought a raffle or lottery ticket	O	O	O	O	O
Bet on a sporting event (i.e. Pro-line)	O	O	O	O	O
Entered draws	O	O	O	O	O
Gone to bingo	O	O	O	O	O
Bet on horse races	O	O	O	O	O
Gone to the casino	O	O	O	O	O

Gambling Consequences

Do you ever spend more money on betting or buying lottery tickets than you want to spend?
O Never O Sometimes O Most of the time O Every time

In the PAST 12 MONTHS, how often have you tried to win back the money you lost?
O Never O Sometimes O Most of the time O Every time

In the PAST 12 MONTHS, have you ever tried but could not stop gambling?
O Never O Sometimes O Most of the time O Every time

In the PAST 12 MONTHS, have you had arguments with family or friends because of the money you spent on betting or gambling?
O Never O Sometimes O Most of the time O Every time

In the PAST 12 MONTHS, have you borrowed money to bet and not paid it back?
O Never O Sometimes O Most of the time O Every time

In the PAST 12 MONTHS, have you ever felt unhappy about the amount you bet or what happens when you gamble?
O Never O Sometimes O Most of the time O Every time

Alcohol Use

Have you EVER had a drink of alcohol, even a sip or two?
O Yes O No ➔ **If NO, SKIP TO QUESTION #7**

Have you EVER had more than a sip or two of alcohol?
O Yes O No ➔ **If NO, SKIP TO QUESTION #7**

On average, when you are drinking alcohol, about how many drinks do you have?
O Less than 1 drink O 1 drink O 2-3 drinks
O 4-6 drinks O 7-10 drinks OOver 10 drinks

Smoking

Have you EVER tried cigarette smoking, even one or two puffs?

O Yes O No ➔ **If NO, SKIP TO QUESTION #13**

Have you EVER smoked a full cigarette?

O Yes O No ➔ **IF NO, SKIP TO QUESTION #13**

How many cigarettes do you usually smoke EACH DAY?

O I no longer smoke O I don't smoke everyday O One O Less than 5
O 6-10 O 11-16 O About a pack O More than a pack

Marijuana Use

In the past 12 MONTHS, how often did you use the following substances? (Remember, your answers are confidential)

SUBSTANCE	NEVER	ONCE	A FEW TIMES A YEAR	A FEW TIMES A MONTH	A FEW TIMES A WEEK	EVERY DAY
Hash, marijuana (weed, joint).....	...O..	...O..	...O..	...O..	...O..	..O..

Hard Drug Use

In the past 12 MONTHS, how often did you use the following substances? (Remember, your answers are confidential)

SUBSTANCE	NEVER	ONCE	A FEW TIMES A YEAR	A FEW TIMES A MONTH	A FEW TIMES A WEEK	EVERY DAY
Cocaine/Crack, crystal meth.....	...O..	...O..	...O..	...O..	...O..	..O..
Uppers, beans, speed, (stimulants).....	...O..	...O..	...O..	...O..	...O..	..O..
Downers, Valium tm, (depressants).....	...O..	...O..	...O..	...O..	...O..	..O..
Heroin, opium (narcotics).....	...O..	...O..	...O..	...O..	...O..	..O..
Acid/LSD, mushrooms, (hallucinogens).....	...O..	...O..	...O..	...O..	...O..	..O..
Ecstasy, Roofies, "Special K," Liquid Ecstasy.....	...O..	...O..	...O..	...O..	...O..	..O..

Sexual Activity

In the last 12 months how often have you engaged in the following?

	NEVER	ONCE	A FEW TIMES A YEAR	A FEW TIMES A MONTH	A FEW TIMES A WEEK	EVERY DAY
Touching a boyfriend's/girlfriend's genitals.....	.....O.....	.....O.....	.....O.....	.....O.....	....O....	..O..
Touching a boyfriend's/girlfriend's genitals with your mouth.....	.....O.....	.....O.....	.....O.....	.....O.....	....O....	..O...
Sexual intercourse	.....O.....	.....O.....	.....O.....	.....O.....	....O....	..O...

During the LAST MONTH, whi how many people did you have sexual intercourse?

O 1 person O 2 people O 3 people O 4 people O 5 people or more

Over the LAST 12 MONTHS how often have you used a condom during sexual intercourse?

O always O more than half the time O half the time
O less than half the time O never

Direct Aggression

How often have YOU (DONE) these things during the LAST SCHOOL YEAR?

	NEVER	A FEW TIMES A YEAR	A FEW TIMES A MONTH	A FEW TIMES A WEEK	EVERY DAY
Pushed and shoved someone	O	O	O	O	O
Swore at someone and called them names	O	O	O	O	O
Teased and ridiculed someone	O	O	O	O	O
Kicked and hit someone	O	O	O	O	O

Indirect Aggression

How often have YOU (DONE) these things during the LAST SCHOOL YEAR?

	NEVER	A FEW TIMES A YEAR	A FEW TIMES A MONTH	A FEW TIMES A WEEK	EVERY DAY
Wrote hurtful and unsigned notes	O	O	O	O	O
Excluded someone from joining an activity	O	O	O	O	O
Spread rumours and untrue stories	O	O	O	O	O
Dared another student to hurt someone	O	O	O	O	O

Major Delinquency

In the LAST 12 MONTHS, how often have you DONE the following?

	NEVER	ONCE	A FEW TIMES	MORE THAN 5 TIMES
Joined a gang	O	O	O	O
Carried a gun as a weapon	O	O	O	O
Carried a knife as a weapon	O	O	O	O

Minor Delinquency

In the LAST 12 MONTHS, how often have you done the following?

	NEVER	ONCE	A FEW TIMES	MORE THAN 5 TIMES
Went joyriding in a car	O	O	O	O
Wrecked other peoples' property	O	O	O	O
Shoplifted	O	O	O	O
Sneaked out at night while your parents thought you were asleep	O	O	O	O

Appendix C: Deleted Questions from Scales

Temperament

Activity Level General Subscale

1. I move around a lot
2. I often stay still for long periods of time
3. I never seem to stop moving
4. I never to be in the same place for long

Approach/Withdrawal Subscale

1. My first reaction is to reject something new or unfamiliar to me
2. It takes me no time at all to get used to new people

Flexibility/Rigidity Subscale

1. It takes me a long time to adjust to new schedules
2. Changes in plans make me restless
3. When things are out of place it takes me a long time to get used to it

Rythmicity/Sleep Subscale

1. I seem to get sleepy just about the same time every night
2. When I am away from home, I still wake up at the same time each morning
3. I wake up at the same time on weekends and holidays as on other days of the week

Mood Subscale

1. I do not laugh or smile at many things
2. I do not find that I laugh often
3. Generally, I am happy

Distractibility Subscale

1. Things going on around me can <u>not</u> take me away from what I am doing
2. I am hard to distract

Neighbourhood Quality

1. Public transportation (bus) is good in my neighbourhood

School Culture

1. Teachers spend almost all classroom time in learning activities
2. Outside interruptions of the classroom are few
3. Students are able to take part in school activities in which they are interested
4. The rules at this school are fair

Parental Attachment

Trust

1. My mother respects my feelings
2. I feel that my mother does a good job as my mother
3. When I am angry about something, my mother tries to be understanding
4. I wish I had a different mother

Communication

1. My mother helps me to understand myself better
2. My mother helps me to talk about my difficulties
3. If my mother knows something is bothering me, she asks me about it
4. I feel it's no use letting my feelings show around my mother

Best Friend Quality

Companionship

1. My friend thinks of fun things for us to do together

Help/Support

1. My friend would help me if I needed it

Security

1. If my friend and I have a fight or argument we can say "I'm sorry" and everything will be alright

Closeness

1. If my friend had to move away I would miss him

Friendship Quality

Trust

1. When I am angry about something, my friends try to be understanding
2. I feel that my friends are good friends
3. My friends respect my feelings

Communication

1. My friends help me to understand myself better
2. My friends encourage me to talk about my difficulties
3. If my friends know something is bothering me, they ask me about it

Alienation

1. I feel the need to be in touch with my friends more often

Social Anxiety

1. I worry about what other children say about me
2. I worry that other kids don't like me
3. I get nervous when I talk to new kids
4. I feel nervous when I'm around certain kids

Appendix D: Research Ethics Approval

Brock University

Senate Research Ethics Board **Extensions**
3205/4315, Room C315

FROM: David Butz, Chair
Senate Research Ethics Board (REB)

TO: Teena Willoughby, Child and Youth Studies

FILE: 00-116, WILLOUGHBY

The Brock University Research Ethics Board has reviewed the revised research proposal:

"Enhancement of youth resiliency and reduction of

harmful behaviours leading to healthy lifestyle choices"

The Research Ethics Board finds that your revised proposal conforms to the Brock University guidelines set out for ethical research.

*** Accepted as clarified**

Please note: Any Changes or Modifications to this approved research must be reviewed and approved by the committee. If so, please complete form #5 - ***Request for Ethics Clearance of a Revision or Modification to an Ongoing application for Ethics Review of Research with Human Participants*** and submit it to the Chair of the Research Ethics Board. You can download this form from the Office of Research Services or visit the web site:
http://www.BrockU.CA/researchservices/mainethicsformpage.html

DB/dvo

Appendix E: Example Announcement

Over the next 8 weeks, students in grades 9, 11, and OAC at 25 secondary schools throughout the _____ (area) will have the opportunity to participate in a questionnaire that will help target youth programs in both your schools and the community. A community and university research alliance is asking you to let them know what things are happening in your life. Too often programs have been designed by some well meaning adult, who thinks they know what youth need. This time, you have a voice in telling the _____ (area) what's needed for youth.

By participating in this questionnaire, you will influence what youth focused programs will be the priority in the region. As well as influencing program direction, a number of university researchers will be looking at the results of the questionnaire to gain a better understanding of the factors that enhance youth's ability to make positive lifestyle choices. You are the expert; there are no wrong answers, only the honest truth about your life.

Appendix F: Parent Consent Form

Dear Parent:

Since January 2000, the X School Board has been an active member of the Community University Research Alliance (CURA), which consists of 15 community organizations and faculty at Brock University. One of the CURA's objectives is to conduct research to better understand factors which foster healthy lifestyle choices in adolescence and into adulthood. In particular, we hope to identify where gaps may exist in services available to youth in the Niagara Region.

Our goal is to better understand youth lifestyle choices, both those involving risk and those that are positive. We believe that if we can gain an understanding of these choices, and of the protective factors that youth will need in life, we can begin to develop more effective ways to enhance their coping skills and enable youth to make positive lifestyle choices. We have created a questionnaire to examine these issues. Your child will be asked to answer a number of questions about lifestyle choices and experiences (e.g., questions involving computer use, physical activity, health, aggression, school culture, substance use, daily hassles, sexual activity, family lifestyle, coping skills, depression, goals, loneliness, anxiety, friendship quality, etc.). A copy of the questionnaire is available in the school office. We hope to conduct the questionnaire again in two years. With this information, we will be in a unique position to explore the pathways students take as they progress through adolescence.

We are writing to ask your permission for your child to participate in this research project. The project has been approved by the Brock University Committee on Research with Human Participants, your child's principal and the X School Board, and is funded by the Social Sciences and Humanities Research Council of Canada. The project will most likely be implemented during the Teacher Advisory Group (TAG) or Physical Education/Health period in your child's class.

You may be wondering how your child benefits from this project. Undoubtedly, the results of this project will give a better understanding of youth in Niagara. This in turn means that community resources, programs and interventions can be better targeted to meet the identified needs of Niagara youth. But more immediately, this project links directly to provincial curriculum for TAG and/or Physical Education/Health. As such, it serves as a teaching and discussion tool to help enrich your child's classroom experience.

All of the information that we record will be kept completely confidential (except in the rare situation in which a child's responses suggest he or she may be in danger of abuse). Only group data will be reported. This group data may eventually be housed in an archive, again with no identifying information. You and your child will be free to withdraw your participation at any time without penalty. More specifically, non-participation will not affect your child's grades in any way.

We hope that you and your child will be willing to participate in our project and we look forward to sharing our findings with you at the end of this project. We have attached a consent form for you to let us know if you would prefer that your child not participate. **Please sign and return the form to the school office only if you do NOT want your child to participate by February 23rd, 2001.** You do not need to return the form if you wish your child to participate.

If you have questions about the project, please attend one of our parent information sessions (see below for dates). Please also feel free to call x at Brock University, 905-688-5550, ext. xxxx (or by email at cura@www.brocku.ca), or Teena Willoughby at Brock University, 905-688-5550, ext. xxxx. For more information, you can access our website www.brocku.ca/cura. Thank you for considering our project.

Sincerely,

Teena Willoughby, Ph.D.
YLC-CURA University Co-Director
Brock University

Heather Chalmers
YLC-CURA Community Co-Director
Centre for Addiction and Mental Health

Parent Information Sessions – If you would like to know more about the questionnaire, at each of the information sessions listed below we will be making a short presentation and answering questions. Feel free to attend any session that is convenient for you

Date	**Location**	**Room**	**Time**
Monday, February 19	X School	Room X	6:30 to 7:30 pm
Monday, February 19	X School	Room X	8:00 to 9:00 pm
Tuesday, February 20	X School	Room X	6:30 to 7:30 pm
Tuesday, February 20	X School	Room X	8:00 to 9:00 pm
Wednesday, February 21	X School	Room X	6:30 to 7:30 pm
Wednesday, February 21	X School	Room X	8:00 to 9:00 pm
Thursday, February 22	X School	Room X	7:00 to 8:00 pm
Thursday, February 22	X School	Room X	8:00 to 9:00 pm

Appendix G: Script for Introduction of Survey

Script for Teachers when Administering Questionnaire

To be read to students:

YLC-CURA is asking you to let them know what things are happening in your life so they can better understand what youth in the Niagara Region are like. There have been too many programs designed by some well meaning adult, who thinks they know what youth need. This time, **you have a voice in telling the (area) on what's needed for youth**.

By participating in this questionnaire, you will influence what youth focused programs will be the priority in the region. As well as influencing program direction, a number of Brock University departments will be looking at the confidential results of this questionnaire to better understand what factors affect youth. That means **you're the expert; there are no wrong answers, only the honest truth about your life.**

The **results of this questionnaire are confidential** and no information will ever be released to the school, parents or anyone else about any individual student's responses. Only if ***you*** indicate so, will you be contacted for additional follow-up. The personal information sheet that you fill out will never accompany your questionnaire results

Only one person will have access to your name and id number. That person will never have access to the questionnaire results. YLC-CURA needs your name in the rare case that a student indicates that they are in danger of being abused. In that situation, a researcher will give the id number to the individual who knows the participant names and numbers. Then, that individual will contact the appropriate agency about the abuse indicated.

It is important to remember that these questions are not designed to suggest all or any of these behaviours and activities is normal or expected. The questions are designed to measure the degree of participation or non-participation by (area) Youth. **You need to tell it the way it really is**, not how Hollywood or TV would have us believe it is.

If at anytime during the questionnaire, you feel uncomfortable answering a question, you do not need to respond to it. **Participating in this questionnaire is voluntary**; and you may decide not to continue at any time. If you decide not to participate, there are no negative outcomes; how you respond to the questionnaire will not affect your grades in any way.

If during or after the questionnaire, you have any concerns that you would like addressed, I (your teacher) can contact, or help you contact an YLC-CURA staff member to discuss any issues. **Remember that you are talking about your life experiences… there are no wrong or right answers and that your opinion really does matter**.

Appendix H: Participant Consent Form

Brock University
Informed Consent Form for Participants

Youth Lifestyle Choices

I understand that this study in which I have agreed to participate will involve answering a series of questions concerning lifestyle choices and experiences.

I understand that my participation in this study is voluntary and that I may withdraw from the study at any time and for any reason without penalty.

I understand that there is no obligation to answer any question in the questionnaire that I consider invasive, offensive or inappropriate.

I understand that all data will be kept confidential and only the YLC-CURA researchers will have access to the data.

Participant Signature _____ Date _____

This study has been reviewed and approved by the Brock Research Ethics Board. (File # 00-116)

If you have any questions or concerns about your participation in the study, you may contact x at 905-688-5550, ext. xxxx.

Appendix I: Contact Me Sheet

Section A:
Would you like the YLC-CURA to help you contact any of the people below? __Yes __No

Who of the following people would you like to talk to about the survey?

__Parents	__Priest/Minister/Rabbi	__Coach
__School Nurse	__Guidance Counsellor	__Doctor
__Teacher	__Youth Counsellor	__Principal

If you indicate that you would like to talk to any of these people, and have indicated that you would like YLC-CURA's help, please provide your name and school/grade information so that one of the researchers involved in this study can contact you. You will be receiving a letter from the YLC-CURA.

Name:_____
School:_____
Grade:_____

Section B:
Are you graduating from high school this year?
__Yes __No

If you are graduating from high school this year, would you be interested in filling out the survey again in two years? If so, what is a good way for us to contact you?

Name:_____
Phone:_____

Mailing the survey to my home address:

_____
_____
_____

Other:

_____
_____

Thank you!